

**UNITED STATES DISTRICT COURT  
WESTERN DISTRICT OF TEXAS  
WACO DIVISION**

<b>TRAXCELL TECHNOLOGIES, LLC.,</b>	)	
<b>Plaintiff,</b>	)	
	)	<b>Civil Action No. 6:21-cv-01312-ADA</b>
<b>v.</b>	)	
	)	
<b>GOOGLE LLC</b>	)	<b>Jury Trial Demanded</b>
<b>Defendant.</b>	)	

**PLAINTIFF’S AMENDED COMPLAINT FOR PATENT INFRINGEMENT**

Traxcell Technologies, LLC. (“Traxcell”) files this Amended Complaint, and demand for jury trial seeking relief from patent infringement by Google LLC (“Defendant” or “Google”), alleging infringement of the claims of U.S. Pat. No. 10,820,147 (referred to as “Patent-in-Suit”), as follows:

**I. THE PARTIES**

1. Plaintiff Traxcell is a Texas Limited Liability Company, with its principal place of business located at 103 Country Club Drive. #508, Marshall, Texas 75672.

2. Defendant Google LLC is a Delaware corporation with a principal place of business located at 1600 Amphitheater Parkway, Mountain View, California 94043. Google designs, manufactures, uses, imports into the United States, sells, and/or offers for sale in the United States smartphones, tablets, iPods, desktop computers, and notebook computers that use Google Maps. Googlemarkets, sells, and offers to sell its products and/or services, including those accused herein of infringement, to actual and potential customers and end-users located in Texas and in the judicial Western District of Texas such as at the Google maintains a permanent physical presence within the Western District of Texas, conducting business from at least its locations at: 9606 North Mo- Pac Expressway, Suite 700, Austin, Texas 78759; 500 West 2nd Street, Suite 2000, Austin, Texas

78701; 4100 Smith School Road, Austin, Texas 78744; as well as other locations in and around the Austin area.

3. Google is registered to do business in Texas and can be served via its registered agent, Corporation Service Company dba CSC – Lawyers Incorporating Service Company at 211 East 7th Street, Suite 620, Austin, Texas 78701-3218.

4. Google has placed or contributed to placing infringing products like the Google Maps for use on a computing device connected to a wireless network into the stream of commerce via an established distribution channel knowing or understanding that such products would be sold and used in the United States, including in the Western District of Texas. On information and belief, Google also has derived substantial revenues from infringing acts, including but not limited to advertising, business APIs, private usage, OEM usage, and/or the like.

## **II. JURISDICTION AND VENUE**

5. This is an action for patent infringement arising under the patent laws of the U.S., 35 U.S.C. §§ 1 et. seq. This Court has subject matter jurisdiction pursuant to 28 U.S.C. §§ 1331, 1332(a) and 1338(a).
6. This Court has personal jurisdiction over Defendants because: Defendants are present within or has minimum contacts within the State of Texas and this judicial district; Defendants have purposefully availed itself of the privileges of conducting business in the State of Texas and in this judicial district; Defendants regularly conducts business within the State of Texas and within this judicial district; and Plaintiff's cause of action arises directly from Defendants' business contacts and other activities in the State of Texas and in this judicial district. The amount in controversy is more than \$75,000.00.

7. Venue is proper in this judicial district per 28 U.S.C. §§ 1391 and 1400(b). Google has committed acts of infringement in this judicial district and maintains regular and established places of business in this district, as set forth above. Google has continuous and systematic business contacts with the State of Texas. Google, directly or through subsidiaries or intermediaries (including distributors, retailers, contract manufacturers, and others), conducts its business extensively throughout Texas, by shipping, manufacturing, distributing, offering for sale, selling, and advertising (including the provision of interactive web pages) its products and services in the State of Texas and the Western District of Texas. Google, directly or through subsidiaries or intermediaries (including distributors, retailers, contract manufacturers, and others), has purposefully and voluntarily placed its infringing products and services into this District and into the stream of commerce with the intention and expectation that they will be purchased and used by consumers in this District.

### **III. INFRINGEMENT ('147 Patent (Attached and incorporated by reference))**

8. On October 27, 2020, U.S. Patent No. 10,820,147 (“the ’147 patent”) entitled “Mobile wireless device providing off-line and on-line geographic navigation information” (attached as Exhibit C) was duly and legally issued by the U.S. Patent and Trademark Office. Traxcell owns the ’147 patent by assignment.

9. The ’147 Patent’s Abstract states, “A mobile device, wireless network and their method of operation provide both on-line (connected) navigation operation, as well as off-line navigation from a local database within the mobile device. Routing according to the navigation system can be controlled by traffic congestion measurements made by the wireless network that allow the navigation system to select the optimum route based on expected trip duration.”

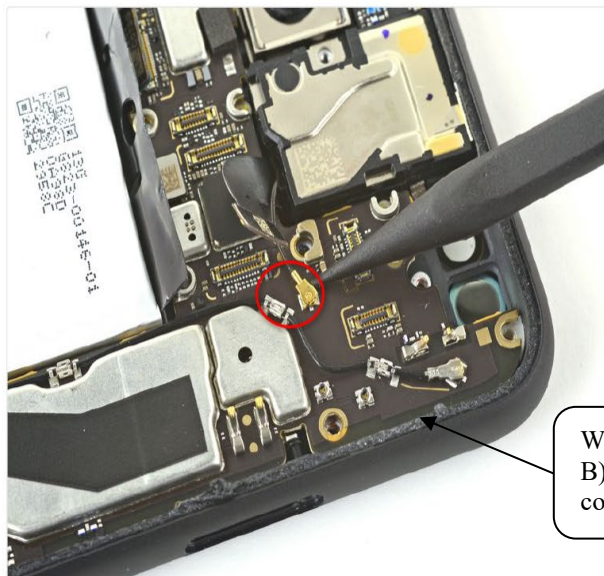
10. The following preliminary exemplary chart provides Traxcell's allegations of infringement.

Claim 1	Corresponding Structure in Accused Systems
1. A wireless communications system including:	<p>The Google Maps online navigation service and the Google Maps server-side or cloud infrastructure needed to provide the service, constitute the "Accused System".</p> <p>Each combination having at least one item listed on Exhibit A, at least one item listed on Exhibit B, and at least one item listed on Exhibit C is a wireless communications system.</p> <p>Because infringement liability is not dependent on ownership, e.g., use of a system can infringe (35 U.S.C. § 271), infringement is not dependent on ownership of all limitations of a claim.</p>
a first radio-frequency transceiver within a wireless mobile communications device and an associated first antenna to which the first radio-frequency transceiver is coupled, wherein the first radio-frequency transceiver is configured for radio-frequency communication with a wireless communications network;	<p>Plaintiff contends each item listed on Exhibit B corresponds to this claim limitation because each Exhibit-B item is a device that provides communicative access to a wireless network by transceivers designed and used for radio-frequency communication and at least one antenna. When a wireless communication device transceivers and antennas are in communication, they are coupled. Further, in addition to being so coupled, the transceiver of each Exhibit-B item is also configured for RF-communication wireless communication networks, such as AT&amp;T, Verizon, T-Mobile, and other US networks (Cellular or WLAN) via Google Maps which comes preloaded on Exhibit-B items.</p> <p>Plaintiff contends each item listed on Exhibit B corresponds to this claim limitation because each Exhibit-B item includes a radio frequency transceiver. Wireless mobile communication device — including but not limited to Google's branded devices such as Google Pixel 5, pixel 4a 5G, pixel 4a, pixel 4 XL, pixel 4, pixel 3a XL, pixel 3a, pixel 3 XL, pixel 3, pixel 2, pixel 2 XL, pixel XL, pixel, pixel C or other (third-parties) branded devices such as Samsung Galaxy S20 Ultra, Galaxy S20 plus, Galaxy S20, Galaxy Z fold, Galaxy S10, Galaxy A series, etc. (refer Exhibit B for complete list) — include radio-frequency transceivers and an associated antenna. When wireless communication device transceivers and antennas are in communication, they are coupled. Further, in addition to being so coupled, the transceiver of each Exhibit-B item is also configured for RF-communication with the wireless communication network.</p> <p>The following exemplifies this limitation's existence in Accused Systems:</p>

## Claim 1

## Corresponding Structure in Accused Systems

## Step 37 Disconnect the antennas



- Use the pointed end of a spudger and pry up gently to unclip the top antenna connector from the motherboard.
- Disconnect the bottom antenna connector.

Wireless mobile communication device (Exhibit B), such as Google pixel 4a includes antenna connector.

## Attachment 1 (Google Pixel 4XL showing antenna connector) at 21.



Google Pixel 4a 5G Disassembly Teardown Repair Video Review


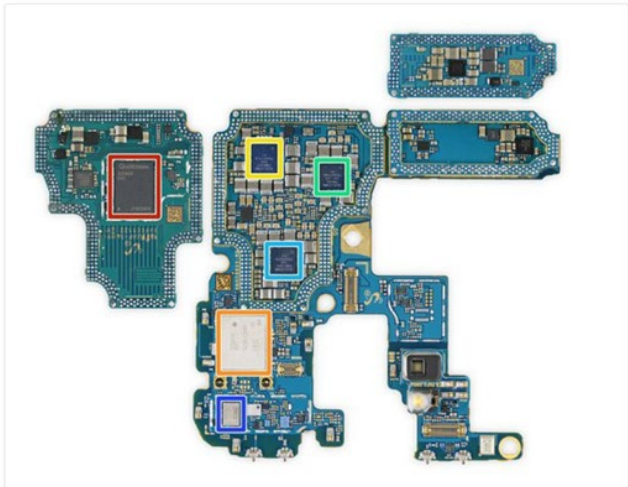
3,430 views • Dec 5, 2020






160 0 SHARE

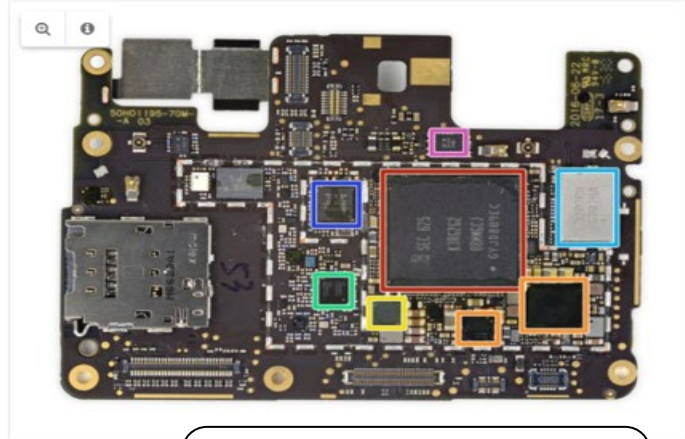
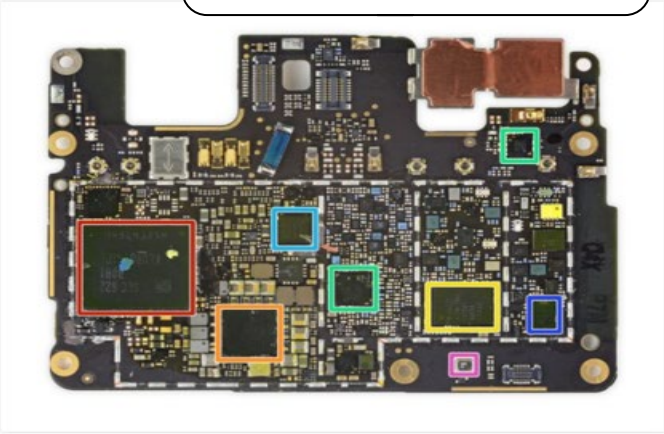
**Source:** Antenna of Google pixel 4a Teardown by PBKreviews (Time 3:58/8:36)

**Link:** <https://www.youtube.com/watch?v=pTPup76PxNo>



Claim 1	Corresponding Structure in Accused Systems
	<div data-bbox="381 283 894 415"><p>Wireless mobile communication device (Exhibit B), such as Google pixel 5 includes antenna Board.</p></div> <div data-bbox="381 283 1481 888"></div> <div data-bbox="381 909 1123 940"><p>Google Pixel 5 5G Disassembly Teardown Repair Video Review. Screen Gap?</p></div> <div data-bbox="381 968 1317 1003"><p>Source: Antenna of Google pixel 5 Teardown by PBKreviews (Time-5:50/7:21)</p></div> <div data-bbox="381 1018 1042 1054"><p>Link: <a href="https://www.youtube.com/watch?v=PPv1SHyok68">https://www.youtube.com/watch?v=PPv1SHyok68</a></p></div> <div data-bbox="381 1117 464 1152"><p>Step 9</p></div> <div data-bbox="381 1178 1005 1661"></div> <div data-bbox="1086 1205 1518 1591"><ul style="list-style-type: none"><li>● But wait! Flippin' the boards over reveals even more flippin' chips:</li><li>● Qualcomm SDR865 RF Tranceiver</li><li>● Murata KM9D19075 Wi-Fi &amp; Bluetooth Module</li><li>● Qualcomm PM8250 power management IC</li><li>● Qualcomm PMX55 power management IC</li><li>● Qualcomm PM8150C power management IC</li><li>● Qualcomm QDM4870 front-end module</li></ul></div> <div data-bbox="735 1682 1198 1833"><p>Wireless mobile communication device (Exhibit B) such as Samsung Galaxy S20 includes RF transceiver.</p></div> <div data-bbox="375 1843 1521 1879"><p>Attachment 2 (Teardown of Samsung Galaxy S20 showing RF Transceiver component) at 8.</p></div>

Claim 1	Corresponding Structure in Accused Systems
	<div><div>Step 5</div><div></div><div><div><div>TOOL USED ON THIS STEP: Manta Driver Kit - 112 Bit Driver Kit</div></div><div>\$64.99</div></div><div><div></div><div><ul style="list-style-type: none"><li>• We continue to raid the toolbag for bigger and beefier tools—like this <a href="#">Manta kit</a> driver, which works equally well for swatting away screws and smashing walnuts. Just don't mix them up.</li><li>ⓘ These screws are all named Phillip. We like Phillip; it's a solid name for a screw.</li><li>• With the top <b>layer of antennas</b>, speaker, and charge coils flipped aside, we get a clear look at the internals. It does look a lot like a <a href="#">Note10+ 5G</a> in there, if you eliminated the stylus and used that space for more battery.</li><li>★ Stay tuned for our <a href="#">teardown wallpaper</a> post! We'll have your Ultra wallpapers, as well as your Plus and your standard S20.</li><li>• We waste no time extracting the main board, which comes so laden with cameras, millimeter-wave hardware, and extra board layers that it feels like only half a victory. Time to start chucking things over-board.</li></ul></div></div><div>Attachment 2 (ifixit Teardown of Samsung Galaxy S20 showing antenna) at 05.</div><div><div>Wireless mobile communication device (Exhibit B), such as Samsung Galaxy S20 includes antenna cables.</div></div></div>

Claim 1	Corresponding Structure in Accused Systems
	<div data-bbox="391 216 1071 709"><p data-bbox="391 216 495 247">Step 10</p></div> <div data-bbox="570 699 1036 842"><p data-bbox="594 716 964 804">Wireless mobile communication device (Exhibit B) such as Google Pixel includes RF transceiver.</p></div> <div data-bbox="391 772 1050 1260"><p data-bbox="391 772 487 804">Step 11</p></div> <div data-bbox="1096 294 1518 1270"><ul style="list-style-type: none"><li>• Chips on the front of the motherboard:<ul style="list-style-type: none"><li>• Samsung K3RG2G20BM-MGCJ 4 GB LPDDR4 mobile DRAM with a quad-core Qualcomm Snapdragon 821 processor layered underneath (two cores clocked at 2.15 GHz and two cores clocked at 1.6 Ghz)</li><li>• Qualcomm PMI8996 power management IC, and Qualcomm SMB1350 Quick Charge 3.0 IC</li><li>• NXP TFA9891 smart audio amplifier</li><li>• Qualcomm WTR4905 LTE RF transceiver</li><li>• 3207RA G707A (looks like Wi-Fi)</li><li>• NXP 55102 1807 S0622 (likely NFC controller)</li><li>• Bosch Sensortec BMI160 low power IMU</li></ul></li><li>• And on the back:<ul style="list-style-type: none"><li>• Samsung KLUBG4G1CE-B0B1 32 GB Universal Flash Storage (UFS) 2.0</li><li>• Qualcomm PM8996 Power Management IC</li><li>• Avago ACPM-7800 power amplifier</li><li>• Qualcomm WTR3925 LTE RF transceiver, and Qualcomm RF360 Dynamic Antenna Matching Tuner (QFE2550)</li><li>• Qualcomm WCD9335 audio codec</li><li>• Skyworks SKY77807 Quad-Band Power Amplifier Module (PAM)</li><li>• Bosch Sensortec BMP280-series barometric pressure sensor</li></ul></li></ul></div>
	<p data-bbox="360 1297 1317 1329"><b>Attachment 13 (Google Pixel showing RF Transceiver component) at 9&amp;10.</b></p>

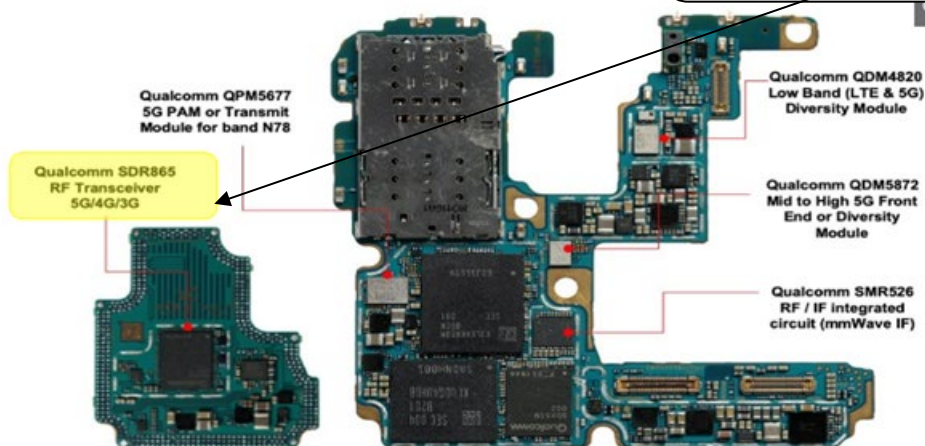


**Claim 1****Corresponding Structure in Accused Systems**


While the 1<sup>st</sup> Gen 5G smartphone supported only single or dual band 5G, the 2<sup>nd</sup> Gen designs like the Samsung Galaxy S20 now support much more. The Galaxy S20 Ultra under review here is model number SM-G988U1 for the North American market which supports low band FDD 5G like n5 (850MHz) and n71 (600MHz) as well as mid-to-high bands like n2, n41 and n66. For 5G global roaming, the Galaxy S20 Ultra also included the common Ultra-High Frequency (UHF) 5G band n78. Further, the Galaxy S20 Ultra has millimeter wave (mmWave) antenna modules in addition to the Sub-6GHz RFFE. The new Qualcomm QTM0525 antenna modules in the Galaxy S20 Ultra support an additional four ultra-wide 5G bands (n258, n257, n260 and n261). So how do all these RF capabilities



**5g-modem-to-rf-integration-rf**


Wireless mobile communication device (Exhibit B) such as Samsung Galaxy S20 Ultra includes RF transceiver.

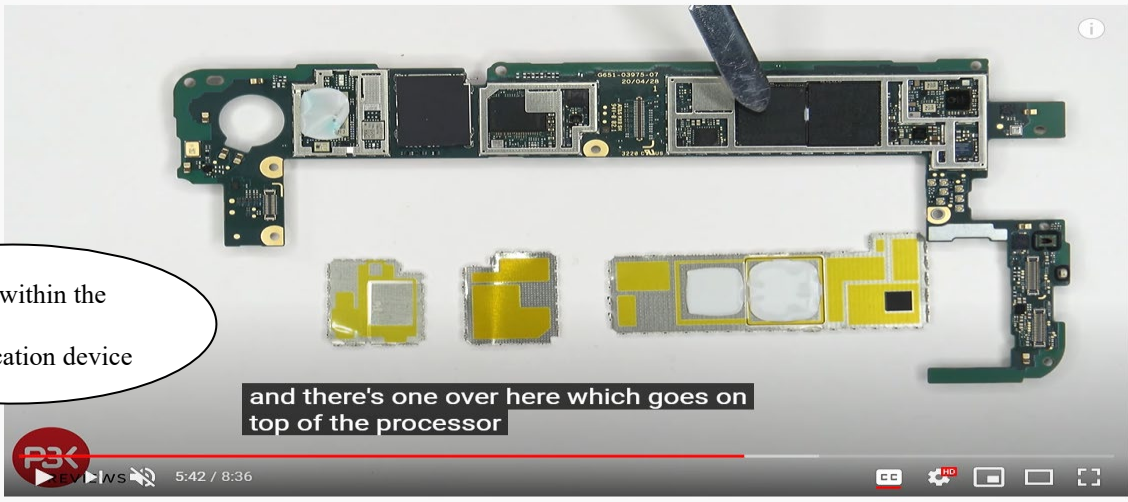
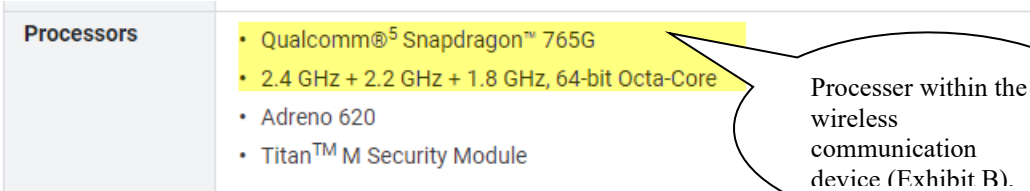


**Attachment 3 (RF-Transceiver and antenna of Galaxy S20 device coupled with communication network) at 7.**

Claim 1	Corresponding Structure in Accused Systems
	<p>The first 5G devices in the US were based on mmWave technology. The 1<sup>st</sup> generation 5G devices were either using Qualcomm's mmWave antenna module design for mmWave networks (Verizon, AT&amp;T, T-Mobile) or a more conventional RFFE design for sub-6 GHz 5G networks (Sprint). However, that represented a design compromise since each variant would be shut out from other 5G network. With the 2<sup>nd</sup> Gen 5G designs like the Galaxy S20 Ultra, OEMs are adding mmWave capabilities along with Sub-6 GHz 5G RFFE on the same device. This dual RFFE design allows flagship devices to be network agnostic, opening up many more 5G network and also benefits Samsung by reducing 5G SKUs.</p> <p><b>5g-modem-to-rf-integration-mmwave</b></p>  <p>Wireless mobile communication device (Exhibit B) such as Samsung Galaxy S20 Ultra includes RF transceiver antenna (mmwave) designed to connect wireless communication network (Verizon, AT&amp;T, T-Mobile, etc.) .</p> <p>3x QTM525</p> <p><b>Attachment 3 (RF-Transceiver and antenna of Galaxy S20 device coupled with communication network) at 10.</b></p>

Claim 1	Corresponding Structure in Accused Systems
	<div data-bbox="394 237 1421 273"> <h3>Change mobile network settings</h3> </div> <div data-bbox="394 291 831 386"> <ol style="list-style-type: none"> <li>1. Open your phone's Settings app.</li> <li>2. Tap Network &amp; internet &gt; Mobile network.</li> <li>3. Tap a setting.</li> </ol> </div> <div data-bbox="394 407 1401 462"> <p>Tip: To reset all your network settings, in your phone's Settings app, tap System &gt; Advanced &gt; Reset options &gt; Reset Wi-Fi, mobile &amp; Bluetooth.</p> </div> <div data-bbox="418 510 1388 537"> <p>Available mobile network settings <span>^</span></p> </div> <div data-bbox="443 573 963 600"> <p>The following options vary by phone and Android version:</p> </div> <div data-bbox="443 619 1364 942"> <ul style="list-style-type: none"> <li>• <b>Mobile data:</b> Turn mobile data on or off.</li> <li>• <b>Roaming:</b> Let your phone send data over other carriers' networks when you're away from your carrier's networks.</li> <li>• <b>App data usage:</b> <a href="#">Learn how to check app usage of your mobile data.</a></li> <li>• <b>Data warning &amp; limit:</b> <a href="#">Learn how to reduce mobile data use.</a></li> <li>• <b>Preferred network type:</b> Pick your preferred network type from options, like 5G and LTE. <a href="#">Learn more about 5G on Pixel phones.</a></li> <li>• <b>Network:</b> Pick your network operator from available networks.</li> <li>• <b>Access point names:</b> Help your carrier find the right IP address for your phone and connect your phone securely.</li> </ul> </div> <div data-bbox="1133 636 1502 756"> <p>Wireless mobile communication device (Exhibit B) able to connect to a wireless communication network</p> </div> <div data-bbox="375 1003 1490 1071"> <p><b>Attachment 14 (Method to connect a wireless communication network via Google pixel 4a device) at 1.</b></p> </div> <div data-bbox="375 1245 480 1285"> <p>Apps</p> </div> <div data-bbox="391 1335 467 1390">  </div> <div data-bbox="479 1344 730 1386"> <p>Google Pay</p> </div> <div data-bbox="391 1400 1482 1463"> <p>Pay with your Android phone at participating stores and within mobile apps with Google Pay™.</p> </div> <div data-bbox="391 1480 893 1512"> <p>Visit <a href="https://support.google.com/pay">support.google.com/pay</a> to learn more.</p> </div> <div data-bbox="386 1528 467 1608">  </div> <div data-bbox="479 1554 599 1596"> <p>Maps</p> </div> <div data-bbox="917 1470 1477 1560"> <p>Google Maps preloaded in the Wireless mobile communication devices (Exhibit B), Such as Galaxy S20, Pixel 4a, Pixel 4a 5G, Pixel 5</p> </div> <div data-bbox="391 1612 1458 1675"> <p>Get directions and other location-based information. You must enable location services to use Google Maps. For more information, see <a href="#">Location</a>.</p> </div> <div data-bbox="391 1692 1019 1722"> <p>Visit <a href="https://support.google.com/maps">support.google.com/maps</a> to learn more.</p> </div> <div data-bbox="375 1757 1430 1791"> <p><b>Attachment 15 (Google Maps application preloaded on Samsung Galaxy S20) at 113.</b></p> </div>

Claim 1	Corresponding Structure in Accused Systems
<div data-bbox="224 976 654 1129" style="border: 1px solid black; border-radius: 10px; padding: 10px; width: fit-content;"> <p>Wireless mobile communication device (Exhibit B) able to connect to a wireless communication network</p> </div>	<div data-bbox="375 226 1482 583">  <p>Attachment 4 (Google Maps application preloaded on Pixel 4a, Pixel 4a 5G, and Pixel 5) at 1.</p> </div> <div data-bbox="375 695 1539 1728"> <div data-bbox="431 695 594 741" style="border: 1px solid red; padding: 2px;">Network<sup>8</sup></div> <ul style="list-style-type: none"> <li>• LTE: Up to 4CC (12 layers) DL &amp; 2CC UL<sup>9</sup></li> <li>5G Sub-6<sup>10</sup></li> <li>• TDD: Up to 1CC x 100 MHz 4x4 MIMO DL &amp; 1CC x 100 MHz UL</li> <li>• FDD: Up to 1CC x 20 MHz 4x4 MIMO DL &amp; 1CC x 20 MHz UL<sup>9</sup></li> <li>5G mmWave [US only]<sup>10, 11</sup></li> <li>• TDD: Up to 4CC x 100 MHz 2x2 MIMO DL &amp; 1CC x 100 MHz 2x2 M</li> </ul> <div data-bbox="699 1014 1117 1056" style="border: 1px solid red; padding: 2px;">[US / FI / CA / TW ] Model G025E</div> <ul style="list-style-type: none"> <li>• GSM/EDGE: Quad-band (850, 900, 1800, 1900 MHz)</li> <li>• UMTS/HSPA+/HSDPA: Bands 1/2/4/5/8</li> <li>• CDMA EVDO Rev A: BC0/BC1/BC10</li> <li>• LTE: Bands B1/2/3/4/5/7/8/12/13/14/17/18/19/20/25/26/28/29, 30/32/38/39/40/41/42/46/48/66/71</li> <li>• 5G Sub-6: Bands n1/2/5/12/25/28/41/66/71/78</li> <li>• eSIM</li> </ul> <div data-bbox="699 1350 1003 1392" style="border: 1px solid red; padding: 2px;">[Verizon] Model G6QU3</div> <ul style="list-style-type: none"> <li>• GSM/EDGE: Quad-band (850, 900, 1800, 1900 MHz)</li> <li>• UMTS/HSPA+/HSDPA: Bands 1/2/4/5/8</li> <li>• CDMA EVDO Rev A: BC0/BC1/BC10</li> <li>• LTE: Bands B1/2/3/4/5/7/8/12/13/14/17/18/19/20/25/26/28/29, 30/32/38/39/40/41/42/46/48/66/71</li> <li>• 5G Sub-6: Bands n2/5/12/25/66/71</li> <li>• 5G mmWave: Bands n260/261</li> <li>• eSIM</li> </ul> </div> <p>Attachment 7 (Pixel phone hardware tech specs) at 6.</p>

Claim 1	Corresponding Structure in Accused Systems
<p>a first processor within the wireless mobile communications device coupled to the at least one first radio-frequency transceiver</p>	<p>Plaintiff contends each item listed on Exhibit B corresponds to this claim limitation because each Exhibit-B item includes a processor. Wireless mobile communication device- including but not limited to Google's branded devices such as Google Pixel 5, pixel 4a 5G, pixel 4a, pixel 4 XL, pixel 4, pixel 3a XL, pixel 3a, pixel 3 XL, pixel 3, pixel 2, pixel 2 XL, pixel XL, pixel, pixel C or other (third-parties) branded devices such as Samsung Galaxy S20 Ultra, Galaxy S20 plus, Galaxy S20, Galaxy Z fold, Galaxy S10, Galaxy A series, etc. (refer Exhibit B for complete list) has a processor, for example, Quad-Core/ Octa-core processor.</p> <p>Each Exhibit-B-listed mobile wireless communications device's motherboard processor is programmed to process location-service information; i.e., to receive a location of the device from the wireless communications network (which is communicated to the device from the first RF transceiver) and generate an indication of the device's location with respect to geographic features according to mapping information stored within the device. For example, the motherboard processor may use Google Maps to view and find places around the globe. The processor and base station transceivers communicate by RF communication and, thus, when doing so are communicatively coupled.</p> <p>The following exemplifies the existence of this limitation in Accused Systems:</p>  <p>Processor within the wireless communication device</p> <p>and there's one over here which goes on top of the processor</p> <p>Google Pixel 4a 5G Disassembly Teardown Repair Video Review</p> <p><b>Source:</b> Processor of Google pixel 4a Teardown by PBKreviews (Time-5:42/8:36)</p> <p><b>Link:</b> <a href="https://www.youtube.com/watch?v=pTPup76PxNo&amp;ab_channel=PBKreviews">https://www.youtube.com/watch?v=pTPup76PxNo&amp;ab_channel=PBKreviews</a></p>  <p><b>Processors</b></p> <ul style="list-style-type: none"> <li>Qualcomm®<sup>5</sup> Snapdragon™ 765G</li> <li>2.4 GHz + 2.2 GHz + 1.8 GHz, 64-bit Octa-Core</li> <li>Adreno 620</li> <li>Titan™ M Security Module</li> </ul> <p>Processor within the wireless communication device (Exhibit B).</p> <p><b>Attachment 7 (Specifications of Google pixel 5) at 1.</b></p>






Claim 1	Corresponding Structure in Accused Systems
	<div data-bbox="391 243 557 310" style="border: 1px solid red; padding: 2px; width: fit-content;">Wireless and Location</div> <ul style="list-style-type: none"> <li>Wi-Fi 2.4 GHz + 5 GHz 802.11a/b/g/n/ac 2x2 MIMO</li> <li>Bluetooth®<sup>10</sup> 5.0 + LE, A2DP (HD codecs: AptX, AptX HD, LDAC, AAC)</li> <li>NFC</li> <li>Google Cast</li> <li>Dual band (L1 + L5) and (E1 + E5a)</li> </ul> <div data-bbox="613 405 662 426" style="background-color: yellow;">[US]</div> <ul style="list-style-type: none"> <li>GPS, GLONASS, Galileo, QZSS</li> </ul> <div data-bbox="613 485 683 506" style="background-color: yellow;">[ROW]</div> <ul style="list-style-type: none"> <li>GPS, GLONASS, Galileo, QZSS, BeiDou</li> </ul> <div data-bbox="391 562 537 604" style="border: 1px solid red; padding: 2px; width: fit-content;">Network<sup>11</sup></div> <ul style="list-style-type: none"> <li>LTE: Up to 4CC (12 layers) DL &amp; 2CC UL<sup>12</sup></li> </ul> <div data-bbox="613 615 732 636" style="background-color: yellow;">5G Sub-6<sup>13</sup></div> <ul style="list-style-type: none"> <li>TDD: Up to 1CC x 100 MHz 4x4 MIMO DL &amp; 1CC x 100 MHz UL</li> <li>FDD: Up to 1CC x 20 MHz 4x4 MIMO DL &amp; 1CC x 20 MHz UL<sup>12</sup></li> </ul> <div data-bbox="613 720 857 741" style="background-color: yellow;">5G mmWave [US only]<sup>13</sup></div> <ul style="list-style-type: none"> <li>TDD: Up to 4CC x 100 MHz 2x2 MIMO DL &amp; 1CC x 100 MHz 2x2 MIMO UL<sup>12</sup></li> </ul> <div data-bbox="613 800 846 821" style="background-color: yellow;">[US / FI] Model GD1YQ</div> <ul style="list-style-type: none"> <li>GSM/EDGE: Quad-band (850, 900, 1800, 1900 MHz)</li> <li>UMTS/HSPA+/HSDPA: Bands 1,2,4,5,6,8,19</li> <li>CDMA EVDO Rev A: BC0/BC1/BC10</li> <li>LTE: Bands B1/2/3/4/5/7/8/12/13/14/17/18/19/20/25/26/28/29/30/32/38/39/40/41/42/46/48/66/71</li> <li>5G Sub-6: Bands n1/2/3/5/7/8/12/28/41/66/71/77/78</li> <li>5G mmWave: Bands n260/n261</li> <li>eSIM</li> </ul> <div data-bbox="1044 300 1515 667" style="border: 1px solid black; border-radius: 15px; padding: 10px; margin-top: 20px;"> <p>Processor within the wireless communication device (Exhibit B), such as google pixel 5 configured to communicate with wireless communication network with help of inbuilt RF transceiver. Further, the processor receive a location of the wireless mobile communications device (Exhibit B) from the wireless communications network</p> </div>

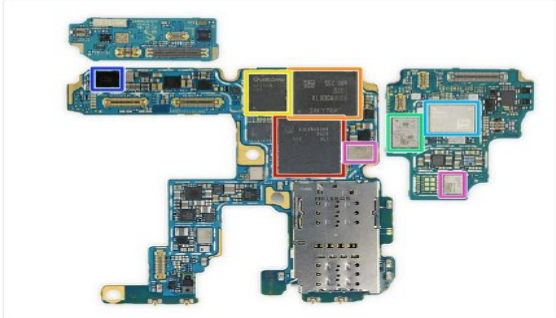
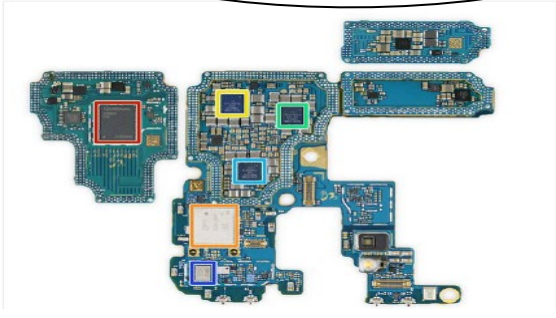
Attachment 7 (Specifications of Google pixel 5) at 2.

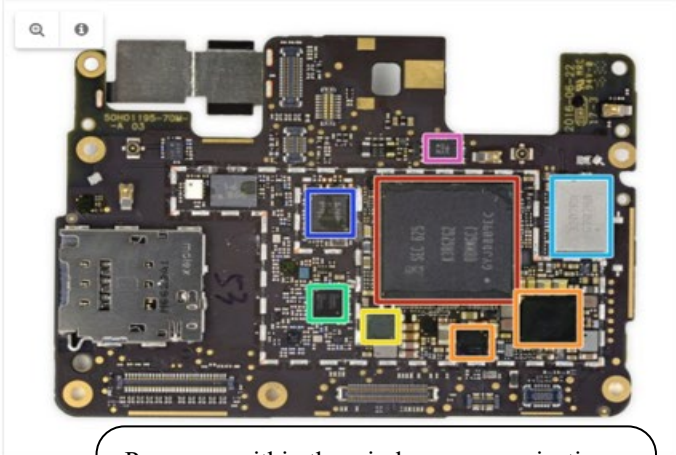
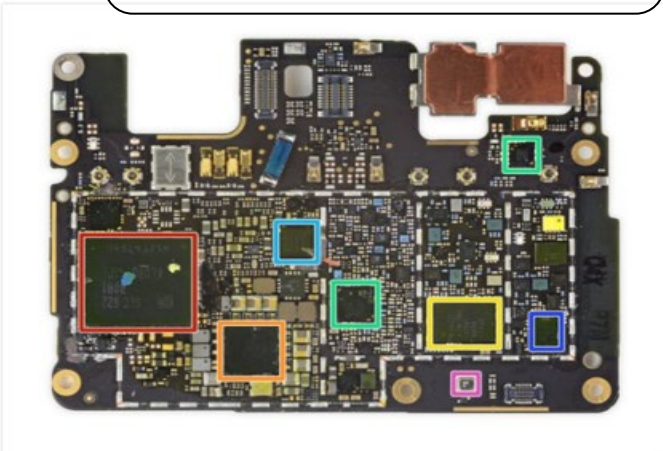
**Claim 1****Corresponding Structure in Accused Systems**

Processor within the wireless communication device (Exhibit B), such as Google Pixel 4a, Pixel 4a 5G and Pixel 5

		 <div> <b>Google Pixel 4a</b>  REVIEW  SPECIFICATIONS  READ OPINIONS  PICTURES </div>		 <div> <b>Google Pixel 4a 5G</b>  PREVIEW  SPECIFICATIONS  READ OPINIONS  PICTURES </div>		 <div> <b>Google Pixel 5</b>  REVIEW  SPECIFICATIONS  READ OPINIONS  PICTURES </div>	
<b>FULL OR DIFFERENCES</b> 1 Change compare mode		128GB 6GB RAM	ALL PRICES	128GB 6GB RAM	ALL PRICES	128GB 8GB RAM	ALL PRICES
<b>NETWORK</b>	<b>Technology</b>	GSM / HSPA / LTE		GSM / HSPA / LTE / 5G		GSM / CDMA / HSPA / EVDO / LTE / 5G	
<b>LAUNCH</b>	<b>Announced Status</b>	2020, August 03 Available. Released 2020, August 20		2020, September 30 Available. Released 2020, November 05		2020, September 30 Available. Released 2020, October 15	
<b>BODY</b>	<b>Dimensions</b>	144 x 69.4 x 8.2 mm (5.67 x 2.73 x 0.32 in)		153.9 x 74 x 8.2 mm (Sub-6) or 8.5 mm (Sub-6 and mmWave)		144.7 x 70.4 x 8 mm (5.70 x 2.77 x 0.31 in)	
	<b>Weight</b>	143 g (5.04 oz)		168 g (5G Sub-6); 171 g (5G Sub-6 and mmWave) (5.93 oz)		151 g (5.33 oz)	
	<b>Build</b>	Glass front (Gorilla Glass 3), plastic back, plastic frame		Glass front (Gorilla Glass 3), plastic back, plastic frame		Glass front (Gorilla Glass 6), aluminum back, aluminum frame	
	<b>SIM</b>	Nano-SIM and/or eSIM		Nano-SIM and/or eSIM		Nano-SIM and/or eSIM IP68 dust/water resistant (up to 1.5m for 30 mins)	
<b>DISPLAY</b>	<b>Type</b>	OLED, HDR		OLED, HDR		OLED, 90Hz, HDR10+	
	<b>Size</b>	5.81 inches, 83.2 cm <sup>2</sup> (~83.3% screen-to-body ratio)		6.2 inches, 95.7 cm <sup>2</sup> (~84.1% screen-to-body ratio)		6.0 inches, 87.6 cm <sup>2</sup> (~85.9% screen-to-body ratio)	
	<b>Resolution</b>	1080 x 2340 pixels, 19.5:9 ratio (~443 ppi density)		1080 x 2340 pixels, 19.5:9 ratio (~413 ppi density)		1080 x 2340 pixels, 19.5:9 ratio (~432 ppi density)	
<b>PLATFORM</b>	<b>Protection</b>	Corning Gorilla Glass 3 Always-on display		Corning Gorilla Glass 3 Always-on display		Corning Gorilla Glass 6 Always-on display	
	<b>OS</b>	Android 10, upgradable to Android 11		Android 11		Android 11	
	<b>Chipset</b>	Qualcomm SDM730 Snapdragon 730G (8 nm)		Qualcomm SM7250 Snapdragon 765G (7 nm)		Qualcomm SM7250 Snapdragon 765G (7 nm)	
	<b>CPU</b>	Octa-core (2x2.2 GHz Kryo 470 Gold & 6x1.8 GHz Kryo 470 Silver)		Octa-core (1x2.4 GHz Kryo 475 Prime & 1x2.2 GHz Kryo 475 Gold & 6x1.8 GHz Kryo 475 Silver)		Octa-core (1x2.4 GHz Kryo 475 Prime & 1x2.2 GHz Kryo 475 Gold & 6x1.8 GHz Kryo 475 Silver)	
	<b>GPU</b>	Adreno 618		Adreno 620		Adreno 620	

Attachment 4 (Processor of Google Pixel 4a, Pixel 4a 5G and Pixel 5) at 1.

Claim 1	Corresponding Structure in Accused Systems
	<p data-bbox="386 233 456 254"><b>Step 8</b></p>  <p data-bbox="386 642 1068 758">Processor within the wireless communication device (Exhibit B), such as Samsung Galxy S20 coupled with RF transceiver and Wi-Fi Module</p> <p data-bbox="386 751 456 772"><b>Step 9</b></p>  <p data-bbox="1008 289 1386 632"> <ul style="list-style-type: none"> <li>With all shields down, we can get a better look at the silicon hiding beneath:</li> <li>Samsung K3LK4K40BM-BGCN 12 GB LPDDR5 RAM layered over Qualcomm 865 SoC</li> <li>Samsung KLUDG4UHDB-B2D1 128 GB UFS 3.0 flash storage</li> <li>Qualcomm SDX55M 2nd-gen 5G modem</li> <li>Skyworks SKY58210-11 RF Front-End Module</li> <li>Qorvo QM78092 Front-End Module</li> <li>Maxim MAX77705C power management IC</li> <li>Qualcomm QPM5677 and QPM6585 5G power amplification modules</li> </ul> </p> <p data-bbox="1255 674 1386 688">Add a comment</p> <p data-bbox="1008 810 1386 1066"> <ul style="list-style-type: none"> <li>But wait! Flippin' the boards over reveals even more flippin' chips:</li> <li>Qualcomm SDR865 RF Tranceiver</li> <li>Murata KM9D19075 Wi-Fi &amp; Bluetooth Module</li> <li>Qualcomm PM8250 power management IC</li> <li>Qualcomm PMX55 power management IC</li> <li>Qualcomm PM8150C power management IC</li> <li>Qualcomm QDM4870 front-end module</li> </ul> </p> <p data-bbox="375 1150 1523 1178"><b>Attachment 2 (Teardown of Samsung Galaxy S20 showing RF Transceiver component) at 8.</b></p>





Claim 1	Corresponding Structure in Accused Systems
	<p><b>Step 10</b></p>  <p>Processor within the wireless communication device (Exhibit B), such as Google pixel coupled with RF transceiver and Wi-Fi Module</p> <p><b>Step 11</b></p>  <p><b>Attachment 13 (Google Pixel showing RF Transceiver component) at 9&amp;10.</b></p> <ul style="list-style-type: none"> <li>Chips on the front of the motherboard: <ul style="list-style-type: none"> <li>Samsung K3RG2G20BM-MGCJ 4 GB LPDDR4 mobile DRAM with a quad-core Qualcomm Snapdragon 821 processor layered underneath (two cores clocked at 2.15 GHz and two cores clocked at 1.6 Ghz)</li> <li>Qualcomm PMI8996 power management IC, and Qualcomm SMB1350 Quick Charge 3.0 IC</li> <li>NXP TFA9891 smart audio amplifier</li> <li>Qualcomm WTR4905 LTE RF transceiver</li> <li>3207RA G707A (looks like Wi-Fi)</li> <li>NXP 55102 1807 S0622 (likely NFC controller)</li> <li>Bosch Sensortec BMI160 low power IMU</li> </ul> </li> <li>And on the back: <ul style="list-style-type: none"> <li>Samsung KLUBG4G1CE-B0B1 32 GB Universal Flash Storage (UFS) 2.0</li> <li>Qualcomm PM8996 Power Management IC</li> <li>Avago ACPM-7800 power amplifier</li> <li>Qualcomm WTR3925 LTE RF transceiver, and Qualcomm RF360 Dynamic Antenna Matching Tuner (QFE2550)</li> <li>Qualcomm WCD9335 audio codec</li> <li>Skyworks SKY77807 Quad-Band Power Amplifier Module (PAM)</li> <li>Bosch Sensortec BMP280-series barometric pressure sensor</li> </ul> </li> </ul>
<p>programmed to receive information indicative of a location of the wireless mobile communications device and generate an indication of a location of the wireless mobile communications device with respect to geographic</p>	<p>Plaintiff contends the Exhibit-B-listed mobile-wireless-communications device's motherboard processor is programmed to process location-service information; i.e., to receive a location of the device from the wireless communications network and generate an indication of the device's location.</p> <p>For example, the motherboard processor may use Google Maps to obtain the device's location and provide direction from that location to a destination. Wireless mobile communication device-including but not limited to Google's branded devices such as Google Pixel 5, pixel 4a 5G, pixel 4a, pixel 4 XL, pixel 4, pixel 3a XL, pixel 3a, pixel 3 XL, pixel 3, pixel 2, pixel 2 XL, pixel XL, pixel, pixel C or other (third-parties) branded devices such as Samsung Galaxy S20 Ultra, Galaxy S20 plus, Galaxy S20, Galaxy Z fold, Galaxy S10, Galaxy A series, etc. (refer Exhibit B for complete list) has a processor for example, Quad-Core processor. When wireless communication device transceivers and processor are in communication, they are coupled. Further, the Location-based Service (LBS) provider, such as Google Map, on the Exhibit-B utilizes the processor coupled to the transceiver to estimates/receive the location on mobile wireless communications devices (specifically one or more of the mobile wireless communications devices identified on</p>

Claim 1	Corresponding Structure in Accused Systems
features	<p>Exhibit B) by utilizing wireless communication network or first computer.</p> <p>For example, the motherboard processor may use Google Maps to view and find places around the globe. Google map can also show your current location and provide direction (including with respect to geographic features such as nearby restaurants) from your location/source to any destination. In using Google Maps App, the mobile wireless communication device's motherboard processor generates signals for displaying on the device's screen a blue dot that shows the current location of the wireless mobile communication device. The Google map app estimates the location of the device from 3 sources: GPS (GPS uses satellites and knows your location within a few meters), Wi-Fi (the location of nearby Wi-Fi networks helps Maps know where you are), and cell towers (cell tower can be accurate up to a few thousand meters). When Google Maps isn't sure about your location, a light blue circle around the blue dot is shown. You might be anywhere within the light blue circle. The smaller the circle, the more certain the app is about your location.</p> <p>Furthermore, Google Maps App provides flexibility to download maps on SD card/internal memory of communication device (Exhibit B) examples of compatible devices is Samsung Galaxy S20, Pixel 4a, Pixel 4a 5G, Pixel 5, etc., and navigate offline. When internet is slow or mobile data is expensive, or communication device cannot connect to internet, an area can be saved to phone or tablet (Exhibit B) from Google maps app and use it when offline. Communication device can use Offline maps for Navigation through the downloaded area without internet.</p> <p>The following exemplifies the existence of this limitation in Accused Systems:</p>

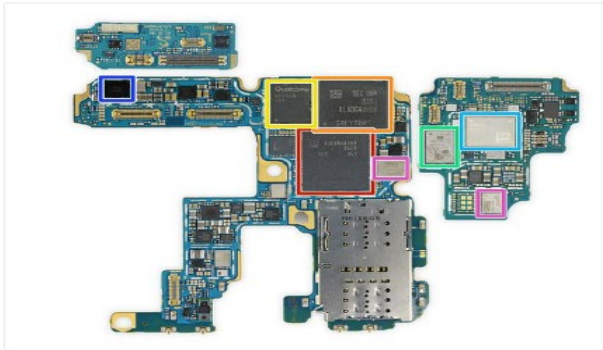
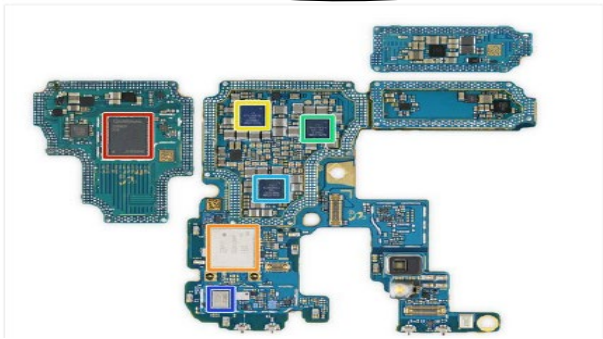


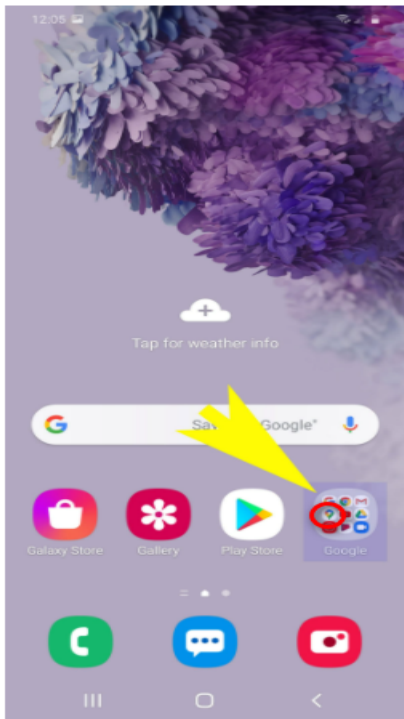
## Claim 1

## Corresponding Structure in Accused Systems



							
		128GB 6GB RAM		128GB 6GB RAM		128GB 8GB RAM	
		ALL PRICES		ALL PRICES		ALL PRICES	
<b>NETWORK</b>	<b>Technology</b>	GSM / HSPA / LTE		GSM / HSPA / LTE / 5G		GSM / CDMA / HSPA / EVDO / LTE / 5G	
<b>LAUNCH</b>	<b>Announced</b>	2020, August 03		2020, September 30		2020, September 30	
	<b>Status</b>	Available. Released 2020, August 20		Available. Released 2020, November 05		Available. Released 2020, October 15	
<b>BODY</b>	<b>Dimensions</b>	144 x 69.4 x 8.2 mm (5.67 x 2.73 x 0.32 in)		153.9 x 74 x 8.2 mm (Sub-6) or 8.5 mm (Sub-6 and mmWave)		144.7 x 70.4 x 8 mm (5.70 x 2.77 x 0.31 in)	
	<b>Weight</b>	143 g (5.04 oz)		168 g (5G Sub-6); 171 g ( 5G Sub-6 and mmWave) (5.93 oz)		151 g (5.33 oz)	
	<b>Build</b>	Glass front (Gorilla Glass 3), plastic back, plastic frame		Glass front (Gorilla Glass 3), plastic back, plastic frame		Glass front (Gorilla Glass 6), aluminum back, aluminum frame	
	<b>SIM</b>	Nano-SIM and/or eSIM		Nano-SIM and/or eSIM		Nano-SIM and/or eSIM	
<b>DISPLAY</b>	<b>Type</b>	OLED, HDR		OLED, HDR		OLED, 90Hz, HDR10+	
	<b>Size</b>	5.81 inches, 83.2 cm <sup>2</sup> (~83.3% screen-to-body ratio)		6.2 inches, 95.7 cm <sup>2</sup> (~84.1% screen-to-body ratio)		6.0 inches, 87.6 cm <sup>2</sup> (~85.9% screen-to-body ratio)	
	<b>Resolution</b>	1080 x 2340 pixels, 19.5:9 ratio (~443 ppi density)		1080 x 2340 pixels, 19.5:9 ratio (~413 ppi density)		1080 x 2340 pixels, 19.5:9 ratio (~432 ppi density)	
	<b>Protection</b>	Corning Gorilla Glass 3 Always-on display		Corning Gorilla Glass 3 Always-on display		Corning Gorilla Glass 6 Always-on display	
<b>PLATFORM</b>	<b>OS</b>	Android 10, upgradable to Android 11		Android 11		Android 11	
	<b>Chipset</b>	Qualcomm SDM730 Snapdragon 730G (8 nm)		Qualcomm SM7250 Snapdragon 765G (7 nm)		Qualcomm SM7250 Snapdragon 765G (7 nm)	
	<b>CPU</b>	Octa-core (2x2.2 GHz Kryo 470 Gold & 6x1.8 GHz Kryo 470 Silver)		Octa-core (1x2.4 GHz Kryo 475 Prime & 1x2.2 GHz Kryo 475 Gold & 6x1.8 GHz Kryo 475 Silver)		Octa-core (1x2.4 GHz Kryo 475 Prime & 1x2.2 GHz Kryo 475 Gold & 6x1.8 GHz Kryo 475 Silver)	
	<b>GPU</b>	Adreno 618		Adreno 620		Adreno 620	

Attachment 4 (Processor of Google Pixel 4a, Pixel 4a 5G and Pixel 5) at 1.

Claim 1	Corresponding Structure in Accused Systems
	<p><b>Step 8</b></p>  <p>Processor within the wireless communication device (Exhibit B), such as Samsung Galaxy S20 coupled with RF transceiver and Wi-Fi Module</p> <p><b>Step 9</b></p>  <p>With all shields down, we can get a better look at the silicon hiding beneath:</p> <ul style="list-style-type: none"> <li>● Samsung K3LK4K40BM-BGCN 12 GB LPDDR5 RAM layered over Qualcomm 865 SoC</li> <li>● Samsung KLUDG4UHDB-B2D1 128 GB UFS 3.0 flash storage</li> <li>● Qualcomm SDX55M 2nd-gen 5G modem</li> <li>● Skyworks SKY58210-11 RF Front-End Module</li> <li>● Qorvo QM78092 Front-End Module</li> <li>● Maxim MAX77705C power management IC</li> <li>● Qualcomm QPM5677 and QPM6585 5G power amplification modules</li> </ul> <p>But wait! Flippin' the boards over reveals even more flippin' chips:</p> <ul style="list-style-type: none"> <li>● Qualcomm SDR865 RF Tranceiver</li> <li>● Murata KM9D19075 Wi-Fi &amp; Bluetooth Module</li> <li>● Qualcomm PM8250 power management IC</li> <li>● Qualcomm PMX55 power management IC</li> <li>● Qualcomm PM8150C power management IC</li> <li>● Qualcomm QDM4870 front-end module</li> </ul> <p><b>Attachment 2 (RF Transceiver and Processor of Samsung Galaxy S20) at 8.</b></p>

Claim 1	Corresponding Structure in Accused Systems
	<p data-bbox="386 254 1536 289">Using Turn-by-Turn Navigation with the Galaxy S20 Google Maps</p> <p data-bbox="386 310 659 333"><b>Time Needed : 8 minutes</b></p> <p data-bbox="386 365 1536 417">The following steps demonstrate the actual process of setting up and utilizing turn-by-turn navigation system with the Google Maps app on the new Samsung Galaxy S20 handset.</p> <p data-bbox="386 420 1536 472">Before you begin, verify and ensure that location is enabled on your phone. It has to be enabled so that your device can determine your current location.</p> <p data-bbox="430 501 1052 525"><b>1. Tap to open the Google folder from the Home screen.</b></p> <p data-bbox="451 527 1273 550">A new screen consisting of Google-related apps and services will be displayed.</p> <div data-bbox="451 577 852 1291">  <p>The screenshot shows a home screen with a purple floral wallpaper. At the top, there is a weather widget with a plus icon and the text 'Tap for weather info'. Below the widget is a Google search bar. Underneath the search bar is a folder containing four icons: Galaxy Store, Gallery, Play Store, and Google. A yellow arrow points to the Google icon. At the bottom of the screen are three dock icons: Phone, Messages, and Camera. The navigation bar at the very bottom shows three icons: a square, a circle, and a triangle.</p> </div> <p data-bbox="924 701 1429 819">Google Maps preloaded in the Wireless mobile communication devices (Exhibit B), such as Galaxy S20. Current location of the device is determined if location is enabled</p> <p data-bbox="373 1323 1084 1354"><b>Attachment 5 (how to use turn by turn Google map) at 1.</b></p>

Claim 1	Corresponding Structure in Accused Systems
	<div data-bbox="425 233 799 646"> </div> <p data-bbox="406 674 805 699">2. <b>Tap Maps to open Google Maps app.</b></p> <p data-bbox="425 699 1403 749">If this is the first time you use Google Maps on your Galaxy S20, you'll be prompted with a Welcome screen. If you see this screen, read and review the information then tap <b>GOT IT</b> to proceed.</p> <div data-bbox="425 774 799 1266"> </div> <div data-bbox="922 850 1490 974"> <p>Google Maps preloaded in the Wireless mobile communication devices (Exhibit B), such as Galaxy S20.</p> </div> <p data-bbox="375 1287 1114 1318"><b>Attachment 5 (how to use turn by turn google map) at 2&amp;3.</b></p>

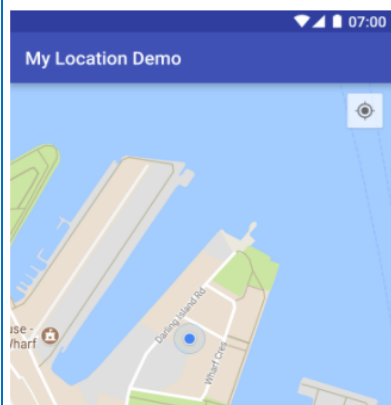
Claim 1	Corresponding Structure in Accused Systems
	<div data-bbox="397 241 662 310">  </div> <div data-bbox="1193 241 1469 294"> <a href="#">Personal</a> <a href="#">Business</a>  <a href="#">Shop</a> <a href="#">Why Verizon</a> <a href="#">Support</a> </div> <div data-bbox="397 367 998 388"> <a href="#">Home</a> &gt; <a href="#">Support</a> &gt; <a href="#">Sony</a> &gt; <a href="#">Sony Xperia Z2</a> &gt; <b>Google Maps - Find Current Location</b> </div> <div data-bbox="397 415 1347 499"> <h2>Google Maps™ - Find Current Location</h2> </div> <div data-bbox="397 520 487 546"> <p>Notes:</p> </div> <div data-bbox="397 562 1307 640"> <ul style="list-style-type: none"> <li>If the Google Maps app isn't already installed on your device, it can be <a href="#">downloaded</a> from the Google Play Store™.</li> <li>For further assistance, refer to the Google Maps <a href="#">Help Center</a>.</li> </ul> </div> <div data-bbox="397 682 941 787"> <ol style="list-style-type: none"> <li>From a Home screen, tap <b>Apps</b>.</li> <li>Tap <b>Maps</b>.</li> <li>Tap the <b>My Location icon</b> (located in the lower-right).</li> </ol> </div> <div data-bbox="990 640 1526 808"> <p>Wireless communication network (e.g. Verizon, AT&amp;T, T-Mobile, etc.) used to estimate the location of the Wireless communication device (Exhibit B) on Google Maps.</p> </div> <p><b>Attachment 6 (Find Current Location on Google map) at 1.</b></p> <div data-bbox="397 924 1477 997">  <input type="text" value="Search Google Maps Help"/> </div> <h3>How Maps finds your current location</h3> <p>Maps estimates where you are from sources like:</p> <ul style="list-style-type: none"> <li><b>GPS:</b> This uses satellites and knows your location within a few meters.</li> <li><b>Wi-Fi:</b> The location of nearby Wi-Fi networks helps Maps know where you are.</li> <li><b>Cell tower:</b> Your connection to a cellular network can be accurate up to a few thousand meters.</li> </ul> <p><b>Attachment 8 (How map finds your current location) at 2.</b></p> <div data-bbox="397 1312 1453 1638"> <h4>What the blue dot means</h4> <p>The blue dot shows you where you are on the map. When Google Maps isn't sure about your location, you'll see a light blue circle around the blue dot. You might be anywhere within the light blue circle. The smaller the circle, the more certain the app is about your location.</p> <p>Notes:</p> <ul style="list-style-type: none"> <li>If the blue dot is not showing, or the dot is gray, this means that we can't find your current location and we're showing you the last location you visited.</li> <li>If there's something between you and cell towers, like a parking garage or tall buildings, your blue dot might not be accurate.</li> </ul> </div> <p><b>Attachment 8 (Current location shown on google map) at 3.</b></p>



## Claim 1

## Corresponding Structure in Accused Systems

The following screenshot shows the My Location button at top right and the My Location blue dot in the center of the map:



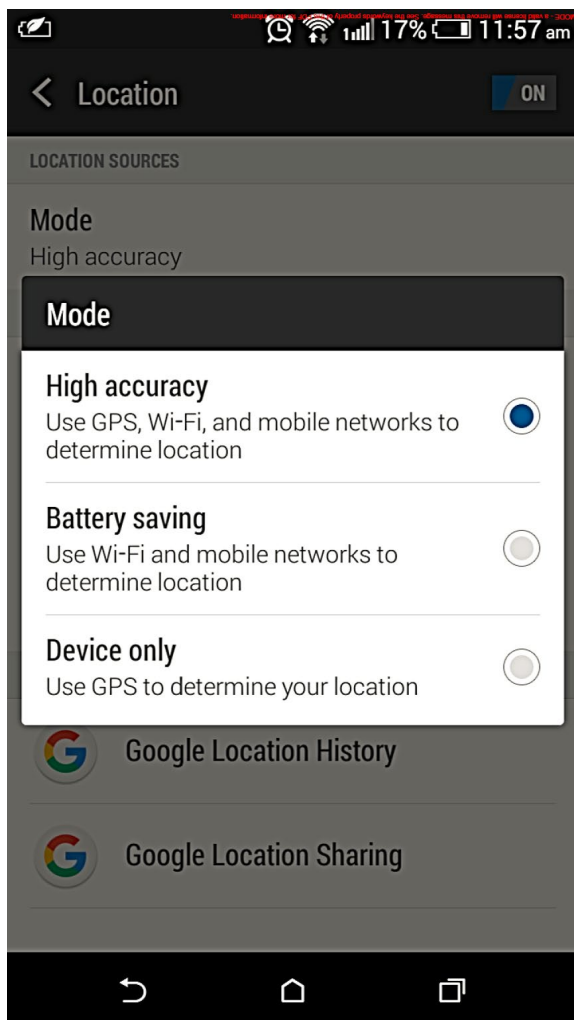
Geographical features cities, streets, etc., on Google Maps

Blue Dot indicating location the map



Processor of the wireless communication device estimated the location of the wireless communication device (Exhibit B) from wireless communication network. The Blue dot showing estimated location.


**Source:** Location estimation on the Wireless communication device

**Attachment 22 (Location estimation on the Wireless communication device) at 10.**



By default the “Location setting” is set at “High accuracy” mode, wherein, for example, accuracy of location of a communications device determined based on locations of nearby Wi-Fi network infrastructure (access points or hotspots) is further enhanced or fine-tuned by Google Maps Server additionally using the said communications device’s GPS location and the location data obtained from the mobile network (Cell tower information and/or Location of the communications device determined through the Assisted-GPS method by the said mobile network) serving the said communications device.

Claim 1	Corresponding Structure in Accused Systems
	<p><b>Attachment 45 (Google Maps_Android app_Location settings) at 1.</b></p> <h2 data-bbox="391 327 1338 384">Find and improve your location's accuracy</h2> <p data-bbox="391 405 1471 499">Sometimes Google Maps might have trouble finding where you are located. If the GPS location of your blue dot on the map is inaccurate or the blue dot is not showing up, here are some things you can do to help fix the problem.</p> <p data-bbox="391 525 1203 552">Tip: This will also improve your search results and make them more relevant to you.</p> <div data-bbox="410 632 823 659"> <p>Computer   <b>Android</b>   iPhone &amp; iPad</p> </div> <hr data-bbox="391 688 1495 693"/> <h3 data-bbox="391 751 1024 793">See your current location on the map</h3> <ol data-bbox="391 814 1461 936" style="list-style-type: none"> <li>1. On your Android phone or tablet, open the Google Maps app .</li> <li>2. You'll see a blue dot, which shows where you are. If you don't see a blue dot, go to the bottom and tap Your location .</li> </ol> <h3 data-bbox="391 999 1024 1041">How Maps finds your current location</h3> <p data-bbox="391 1062 870 1089">Maps estimates where you are from sources like:</p> <ul data-bbox="391 1115 1484 1260" style="list-style-type: none"> <li>• <b>GPS:</b> This uses satellites and knows your location up to around 20 meters. <b>Note:</b> When you're inside buildings or underground, the GPS is sometimes inaccurate.</li> <li>• <b>Wi-Fi:</b> The location of nearby Wi-Fi networks helps Maps know where you are.</li> <li>• <b>Cell tower:</b> Your connection to a cellular network can be accurate up to a few thousand meters.</li> </ul> <p><b>Attachment 46 (Find and improve your location's accuracy - Android - Google Maps Help) at 1.</b></p>

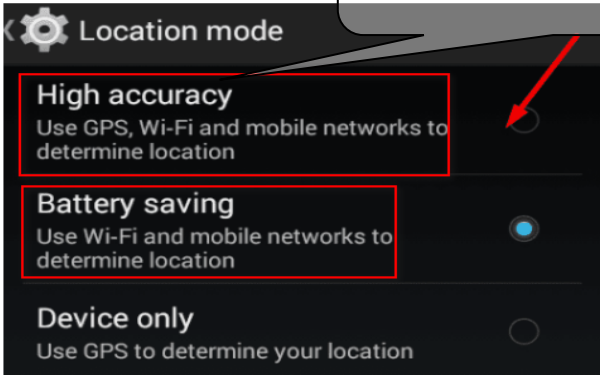
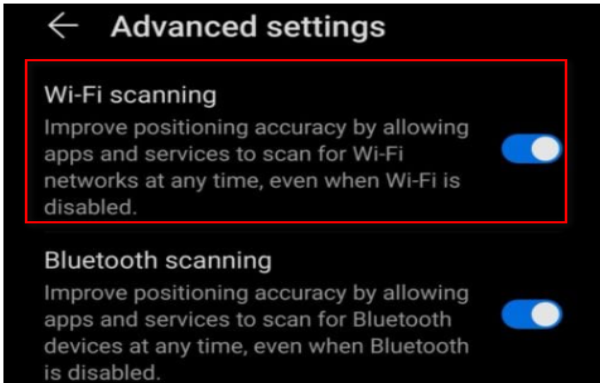
Claim 1	Corresponding Structure in Accused Systems
	<p data-bbox="386 247 625 277"><b>From your devices</b></p> <p data-bbox="386 306 1495 447">Many devices, like phones or computers, can work out their precise location. You can allow Google and other apps to provide you with useful features based on where your device is located. For example, if you're running late to meet your friends, you'll probably want to use a navigation app to know the quickest way to get to your destination. To get turn-by-turn directions, you may need to turn on your device's location and give the app the permission to access it. Or for some searches like "coffee shop", "bus stop" or "atm", results will usually be more helpful when precise location is available.</p> <p data-bbox="386 491 1479 611">On your Android device, if you choose to <b>turn on</b> your device location, you can use features like navigation, giving an app access to your current location, or find your phone. You can also choose which apps have permission to use your device's location with simple controls that let you turn the permission on or off for individual apps. On Android, you can see when an app is requesting to use your phone's GPS-based location when the top of your screen shows Location . <a href="#">Learn more</a></p> <p data-bbox="444 636 690 665"><b>Google Location Services</b></p> <p data-bbox="444 699 1437 903">On most Android devices, Google, as the network location provider, provides a location service called Google Location Services (GLS), known in Android 9 and above as Google Location Accuracy. This service aims to provide a more accurate device location and generally improve location accuracy. Most mobile phones are equipped with GPS, which uses signals from satellites to determine a device's location – however, with Google Location Services, additional information from nearby Wi-Fi, mobile networks, and device sensors can be collected to determine your device's location. It does this by periodically collecting location data from your device and using it in an anonymous way to improve location accuracy.</p> <p data-bbox="444 945 1430 1056">You can disable Google Location Services at any time in your device's location settings. Your device's location will continue to work even if GLS is turned off, but the device will rely only on GPS to estimate device location for apps with the necessary permission. Google Location Services is distinct from your device's location setting. <a href="#">Learn more</a></p> <p data-bbox="386 1102 1474 1186">The settings and permissions on Android control whether your device sensors (like GPS) or network-based location (like GLS) are used to determine your location and which apps have access to that location. They do not impact how websites and apps might estimate your location in other ways, such as from your IP Address.</p> <p data-bbox="375 1213 1479 1276"><b>Attachment 44 (How Google uses location information – Privacy &amp; Terms – Google) at 2 &amp;3.</b></p>

Wireless communication device receive the location of the Wireless communication device (Exhibit B) on Google Map from Wireless communication networks (e.g. Verizon, AT&T, T-Mobile, etc.)

Claim 1	Corresponding Structure in Accused Systems
	<p data-bbox="394 226 1195 264"><b>Turn your phone's location accuracy on or off</b></p> <ol data-bbox="394 285 1122 394" style="list-style-type: none"> <li>1. Open your device's Settings app.</li> <li>2. Tap Location &gt; Advanced &gt; Google Location Accuracy.</li> <li>3. Turn Improve Location Accuracy on or off.</li> </ol> <hr data-bbox="394 415 1537 420"/> <p data-bbox="418 447 937 478">When Google Location Accuracy is on</p> <p data-bbox="456 516 1537 579">When you have Google Location Accuracy turned on, your phone uses these sources to get location:</p> <ul data-bbox="456 604 699 758" style="list-style-type: none"> <li>• GPS</li> <li>• <b>Wi-Fi</b></li> <li>• <b>Mobile networks</b></li> <li>• Sensors</li> </ul> <hr data-bbox="394 810 1537 814"/> <p data-bbox="418 842 941 873">When Google Location Accuracy is off</p> <p data-bbox="456 911 1537 974">When you turn off Google Location Accuracy, your phone uses only GPS to find location. GPS is less accurate than other sources.</p> <p data-bbox="394 1077 1317 1115"><b>Let your phone scan for nearby networks or devices</b></p> <p data-bbox="394 1136 1537 1167">To help apps get better location info, you can let your phone scan for nearby Wi-Fi access points</p> <ol data-bbox="394 1188 1052 1297" style="list-style-type: none"> <li>1. Open your device's Settings app.</li> <li>2. Tap Location &gt; <b>Wi-Fi and Bluetooth scanning</b>.</li> <li>3. Turn Wi-Fi scanning or Bluetooth scanning on or off.</li> </ol> <p data-bbox="370 1339 1195 1371"><b>Attachment 21 (Manage your Pixel phone's location settings) at 2.</b></p>

Claim 1	Corresponding Structure in Accused Systems
	<p data-bbox="391 239 878 268">If you use an older Android version</p> <p data-bbox="410 296 769 317">Choose location settings (Android 9.0) ^</p> <p data-bbox="433 342 664 359">To change location settings:</p> <ol data-bbox="440 373 808 438" style="list-style-type: none"> <li>1. Open your device's Settings app.</li> <li>2. Tap <b>Security &amp; Location</b> &gt; <b>Location</b>. <ul style="list-style-type: none"> <li>• If you have a work profile, tap <b>Advanced</b>.</li> </ul> </li> </ol> <p data-bbox="433 453 628 470">Then, choose an option:</p> <ul data-bbox="440 485 1276 590" style="list-style-type: none"> <li>• Turn Location on or off: Tap <b>Location</b>.</li> <li>• Scan for nearby networks: Tap <b>Advanced</b> &gt; <b>Scanning</b>. Turn Wi-Fi scanning or Bluetooth scanning on or off.</li> <li>• Turn emergency location service on or off: Tap <b>Advanced</b> &gt; <b>Google Emergency Location Service</b>. Turn <b>Emergency Location Service</b> on or off.</li> </ul> <p data-bbox="410 642 794 663">Choose location mode (Android 4.4–8.1) ^</p> <p data-bbox="433 688 1076 705">You can choose your location mode based on accuracy, speed, and battery use.</p> <ol data-bbox="440 720 1175 785" style="list-style-type: none"> <li>1. Open your phone's Settings app.</li> <li>2. Tap <b>Security &amp; Location</b> &gt; <b>Location</b>. If you don't see "Security &amp; Location," tap <b>Location</b>.</li> <li>3. Tap <b>Mode</b>. Then pick:</li> </ol> <ul data-bbox="462 791 1263 917" style="list-style-type: none"> <li>• <b>High accuracy:</b> Use GPS, Wi-Fi, mobile networks, and sensors to get the most accurate location. Use Google Location Services to help estimate your phone's location faster and more accurately.</li> <li>• <b>Battery saving:</b> Use sources that use less battery, like Wi-Fi and mobile networks. Use Google Location Services to help estimate your phone's location faster and more accurately.</li> <li>• <b>Device only:</b> Use only GPS. Don't use Google Location Services to provide location information. This can estimate your phone's location more slowly and use more battery.</li> </ul> <p data-bbox="410 970 805 991">Choose location access (Android 4.1–4.3) ^</p> <p data-bbox="433 1016 941 1033">You can control what location information your phone can use.</p> <ol data-bbox="440 1047 954 1113" style="list-style-type: none"> <li>1. Open your phone's Settings app.</li> <li>2. Under "Personal," tap <b>Location access</b>.</li> <li>3. At the top of the screen, turn <b>Access to my location</b> on or off.</li> </ol> <ul data-bbox="462 1119 1276 1268" style="list-style-type: none"> <li>• When location access is on, pick either or both of: <ul style="list-style-type: none"> <li>• <b>GPS satellites:</b> Lets your phone estimate its location from satellite signals, like a GPS device in a car.</li> <li>• <b>Wi-Fi &amp; mobile network location:</b> Lets your phone use Google Location Services to help estimate its location faster, with or without GPS.</li> </ul> </li> <li>• When location access is off: <ul style="list-style-type: none"> <li>Your phone can't find its precise location or share it with any apps.</li> </ul> </li> </ul> <p data-bbox="433 1283 1276 1318"><b>Tip:</b> If you have a tablet that more than one person uses, each person can have different location access settings.</p> <p data-bbox="375 1346 1247 1375"><b>Attachment 40 (Manage your Pixel phone's location settings) at 3 &amp; 4.</b></p>



Claim 1	Corresponding Structure in Accused Systems
	<p>1. On your Android device, go to <b>Settings</b></p> <p>2. Tap <b>Location</b> and re-enable your location services</p> <p>3. Select <b>Mode High accuracy</b></p> <p>The user of the wireless device can select the method of the location estimation</p>  <p>On some phone models, this option can be found under the Advanced Settings option.</p> <p>Select <b>Advanced Settings</b> and enable your device to improve positioning accuracy by allowing apps to scan for Wi-Fi networks and Bluetooth devices at any time, even if Wi-Fi or Bluetooth is disabled.</p>  <p><b>Attachment 33 (Google Maps Not Updating Location) at 4.</b></p>

**Claim 1****Corresponding Structure in Accused Systems**

	DESCRIPTION	OPT-IN / OPT-OUT	USER CHOICES
LOCATION SERVICES	"Use Google's location service to help apps determine your location. Anonymous location data will be sent to Google when your device is on."	Opt-Out	"YES, I'M IN" or "SKIP"
LOCATION ACCURACY	Three Modes - "High accuracy", "Battery saving", and "Device only". Default setting: "High accuracy use(s) GPS, Wi-Fi, Bluetooth, or cellular networks to determine location"	Opt-Out	Toggle icon (right and colored for on, left and gray for off). This setting not shown during Android set-up.
LOCATION SCANNING	"Improve location accuracy by allowing apps and services to scan for Wi-Fi and Bluetooth, even when those settings are off."	Opt-Out	Toggle icon (right and colored for on, left and gray for off).
LOCATION HISTORY	"[A]llows Google to store a history of your location data from all devices where you are logged into your Google Account and have enabled Location Reporting. Location History and Location Reporting data may be used by any Google app or service."	Opt-Out	"YES, I'M IN" or "NO THANKS"  In the context of "Give your new Assistant permission to help you"

Figure 1: Four Android settings and services that relate to location information collection.<sup>1</sup>

**Google Location Services**

Google Location Services (GLS) operate at a device level and rely on sensors such as GPS, Wi-Fi, the cellular radio, and other technologies included in mobile devices to position a user in the world. If a user keeps the default settings prompted by Google, Location Services is enabled, Location Accuracy will be set to "High Accuracy"<sup>2</sup> and Location Scanning will be enabled for both Wi-Fi base stations and Bluetooth Beacons, regardless of a user's choice to turn Wi-Fi or Bluetooth on. The implications of user choices among the various Location Services settings are significant, but not intuitive, including:

- With Location Services turned on, Location Accuracy set to "Device only" and Location Scanning turned off, an Android device will only use GPS to provide the location of an Android device.
- When Location Accuracy is set to "High accuracy" and Location Scanning is enabled (the default setting for new device setup), an Android device will use sources including Wi-Fi, Bluetooth, and cellular radio to improve the accuracy of the device's position.

Attachment 38 (Google, Android and Location Tracking) at 2.

**Claim 1****Corresponding Structure in Accused Systems**

After completing the setup process users can validate and control settings for device location via the Settings app and navigating to Google settings, then Location (Figure 4).

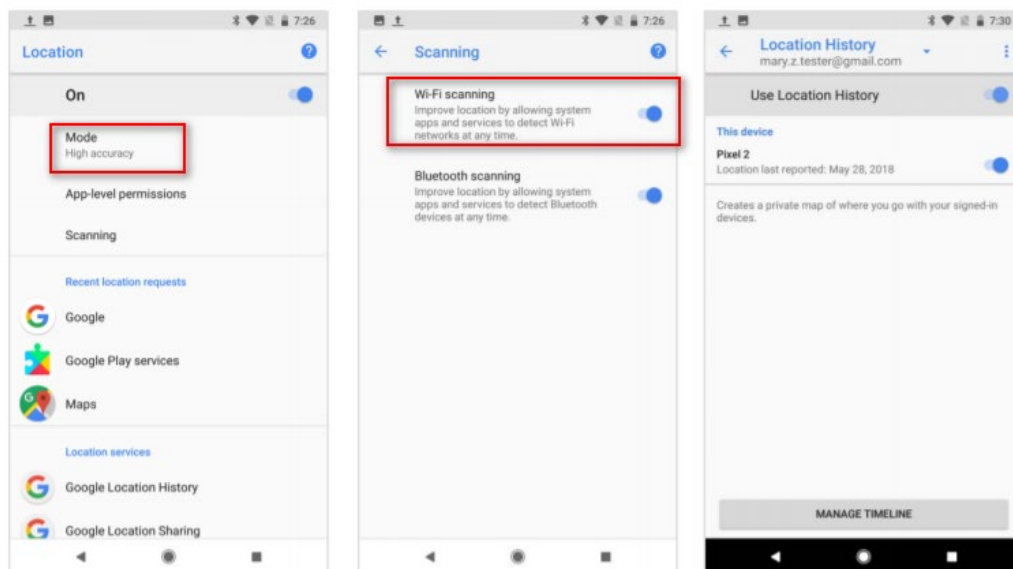
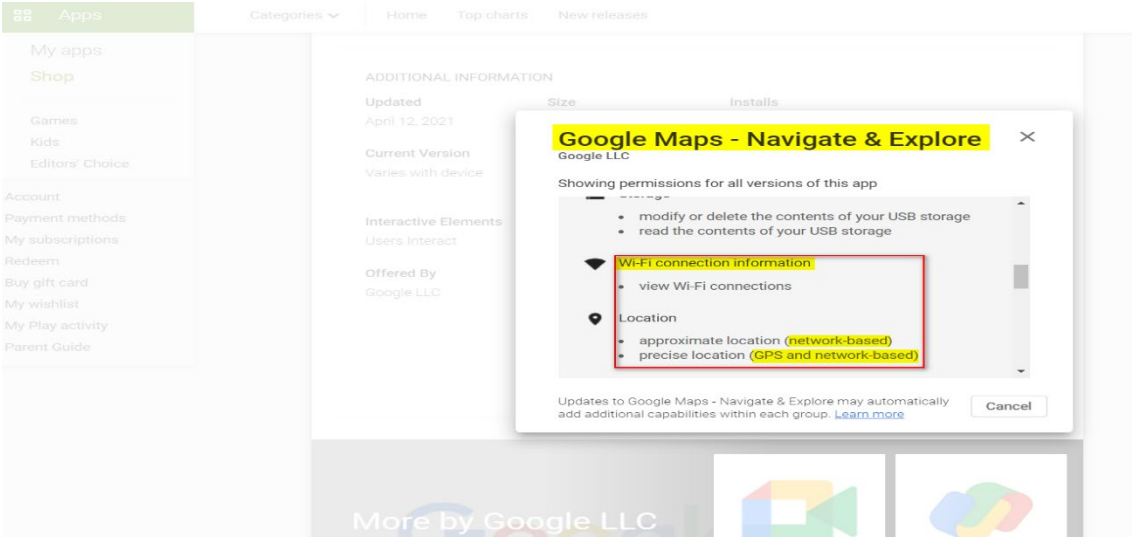


Figure 4: Location settings after Android device setup process

As demonstrated in Figure 4, if users accept Google's defaults during the setup process, the Android device is configured with Location Services enabled, Wi-Fi and Bluetooth scanning engaged, and Location History active.

**Attachment 38 (Google, Android and Location Tracking) at 5.**

Claim 1	Corresponding Structure in Accused Systems
	<p>Users can choose to disable GLS during the set-up process. However, if a user attempts to disable GLS, a warning dialogue box prompts an extreme scenario: “device location for all apps is turned off and you may not be able to locate your device if it is lost.” (Figure 5) Note as well, the action prompt is to “Turn on Location” – reversing the user choice triggering the warning. Further, as described immediately below, many Google and third party apps will not function unless GLS is turned on. Therefore, Google forces user into an impossible ultimatum, have their every move constantly monitored, tracked, and stored or lose the functionality of their expensive smartphone.</p> <p>If a user disables Location Services but then attempts to use a location aware app or service on their device, she will see the dialogue box shown in Figure 6. If the user clicks “OK” the service is enabled for the entire device and permanently, rather than enabling Location Services only for that particular app or service requesting the functionality.</p> <div data-bbox="532 604 849 1081" data-label="Image"> </div> <div data-bbox="532 1087 849 1110" data-label="Caption"> <p>Figure 5: Location Services Warning</p> </div> <div data-bbox="941 604 1266 1081" data-label="Image"> </div> <div data-bbox="979 1087 1230 1131" data-label="Caption"> <p>Figure 6: Re-Enable Location Services</p> </div> <p><b>Attachment 38 (Google, Android and Location Tracking) at 6.</b></p> <p>We collect information about your location when you use our services, which helps us offer features like driving directions for your weekend getaway or showtimes for movies playing near you.</p> <p>Your location can be determined with varying degrees of accuracy by:</p> <ul style="list-style-type: none"> <li>• GPS</li> <li>• IP address</li> <li>• Sensor data from your device</li> <li>• Information about things near your device, such as Wi-Fi access points, cell towers, and Bluetooth-enabled devices</li> </ul> <p>The types of location data we collect depend in part on your device and account settings. For example, you can turn your Android device's location on or off using the device's settings app. You can also turn on Location History if you want to create a private map of where you go with your signed-in devices.</p> <p><b>Attachment 29 (Google Privacy Policy) at 4.</b></p>

Claim 1	Corresponding Structure in Accused Systems
	 <p><b>Attachment 39 (Google Map_Permissions) at 1.</b></p> <p>Overview <span style="float: right;">↑</span></p> <div style="border: 1px solid red; padding: 5px; margin: 10px 0;"> <p>The Google Maps Geolocation API returns a location and accuracy radius based on information about <b>cell towers and WiFi nodes</b> that the mobile client can detect. This document describes the protocol used to send this data to <b>the server</b> and to return a response to the client.</p> </div> <p>Communication is done over HTTPS using POST. Both request and response are formatted as JSON, and the content type of both is <code>application/json</code>.</p> <p><b>Attachment 17 (Cell Towers/Wi-Fi Nodes (RF transceivers) in a wireless communication network) at 1.</b></p> <p>Knowing where the user is allows your application to be smarter and deliver better information to the user. When developing a location-aware application for Android, you can utilize GPS and Android's Network Location Provider to acquire the user location. Although GPS is most accurate, it only works outdoors, it quickly consumes battery power, and doesn't return the location as quickly as users want. <b>Android's Network Location Provider determines user location using cell tower and Wi-Fi signals,</b> providing location information in a way that works indoors and outdoors, responds faster, and uses less battery power. To obtain the user location in your application, you can use both GPS and the Network Location Provider, or just one.</p> <p><b>Attachment 12 (Location of the device determined using cell tower) at 1&amp;2.</b></p>



**Claim 1****Corresponding Structure in Accused Systems**

The first parameter in `requestLocationUpdates()` is the type of location provider to use (in this case, the Network Location Provider for cell tower and Wi-Fi based location). You can control the frequency at which your listener receives updates with the second and third parameter—the second is the minimum time interval between notifications and the third is the minimum change in distance between notifications—setting both to zero requests location notifications as frequently as possible. The last parameter is your `LocationListener`, which receives callbacks for location updates.

To request location updates from the GPS provider, use `GPS_PROVIDER` instead of `NETWORK_PROVIDER`. You can also request location updates from both the GPS and the Network Location Provider by calling `requestLocationUpdates()` twice—once for `NETWORK_PROVIDER` and once for `GPS_PROVIDER`.

### Requesting User Permissions

Google Maps application makes use of wireless communication network, having cell towers (Exhibit A) or Wi-Fi access points (Exhibit A), to estimate the location of the Wireless communication device (Exhibit B).

In order to receive location updates from `NETWORK_PROVIDER`, `ACCESS_COARSE_LOCATION` or `ACCESS_FINE_LOCATION` permission, respectively, in your Android manifest file. Without these permissions, your application will fail at runtime when requesting location updates.

If you are using both `NETWORK_PROVIDER` and `GPS_PROVIDER`, then you need to request only the `ACCESS_FINE_LOCATION` permission, because it includes permission for both providers. Permission for `ACCESS_COARSE_LOCATION` allows access only to `NETWORK_PROVIDER`.

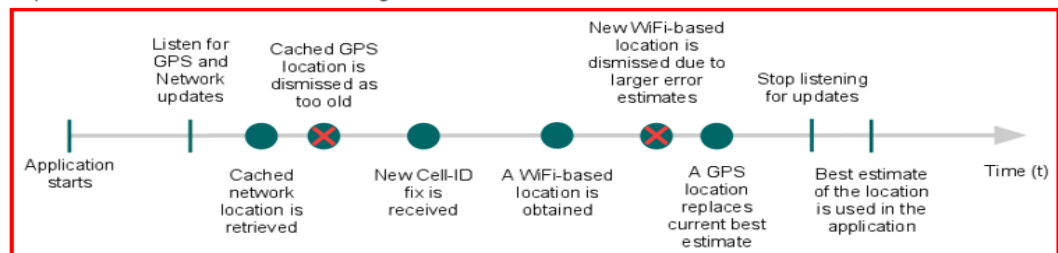
#### Attachment 12 (Location is estimated using cell tower/wi-fi network) at 3 & 4.

##### Flow for obtaining user location

Here's the typical flow of procedures for obtaining the user location:

1. Start application.
2. Sometime later, start listening for updates from desired location providers.
3. Maintain a "current best estimate" of location by filtering out new, but less accurate fixes.
4. Stop listening for location updates.
5. Take advantage of the last best location estimate.

Figure 1 demonstrates this model in a timeline that visualizes the period in which an application is listening for location updates and the events that occur during that time.



#### Attachment 12 (Location is estimated using cell tower/wi-fi network) at 5.

Claim 1	Corresponding Structure in Accused Systems
	<p><b>There are 3 location providers in Android.</b></p> <p>They are:</p> <p><b>gps → (GPS, AGPS):</b> Name of the GPS location provider. <b>This provider determines location using satellites.</b> Depending on conditions, this provider may take a while to return a location fix. Requires the permission <code>android.permission.ACCESS_FINE_LOCATION</code>.</p> <p><b>network → (AGPS, CellID, WiFi MACID):</b> Name of the network location provider. This provider <b>determines location based on availability of cell tower and WiFi access points.</b> Results are retrieved by means of a network lookup. Requires either of the permissions <code>android.permission.ACCESS_COARSE_LOCATION</code> or <code>android.permission.ACCESS_FINE_LOCATION</code>.</p> <p><b>passive → (CellID, WiFi MACID):</b> A special location provider for receiving locations without actually initiating a location fix. This provider can be used to passively receive location updates when other applications or services request them without actually requesting the locations yourself. This provider will return locations generated by other providers. Requires the permission <code>android.permission.ACCESS_FINE_LOCATION</code>, although if the GPS is not enabled this provider might only return coarse fixes. This is what Android calls these location providers, however, the underlying technologies to make this stuff work is mapped to the specific set of hardware and telco provided capabilities (network service).</p> <p><b>The best way is to use the “network” or “passive” provider first, and then fallback on “gps”, and depending on the task, switch between providers. This covers all cases, and provides a lowest common denominator service (in the worst case) and great service (in the best case).</b></p> <p><b>Attachment 41 (Android Location Providers - GPS or Network Provider?) at 1 &amp; 2.</b></p> <p>Accuracy</p> <p>You can specify location accuracy using the <code>setPriority()</code> method, passing one of the following values as the argument:</p> <ul style="list-style-type: none"> <li><b>PRIORITY_HIGH_ACCURACY</b> provides the most accurate location possible, which is computed using as many inputs as necessary (it enables GPS, Wi-Fi, and cell, and uses a variety of <a href="#">Sensors</a>), and may cause significant battery drain.</li> <li><b>PRIORITY_BALANCED_POWER_ACCURACY</b> provides accurate location while optimizing for power. Very rarely uses GPS. Typically uses a combination of Wi-Fi and cell information to compute device location.</li> <li><b>PRIORITY_LOW_POWER</b> largely relies on cell towers and avoids GPS and Wi-Fi inputs, providing coarse (city-level) accuracy with minimal battery drain.</li> <li><b>PRIORITY_NO_POWER</b> receives locations passively from other apps for which location has already been computed.</li> </ul> <p>The location needs of most apps can be satisfied using the balanced power or low power options. High accuracy should be reserved for apps that are running in the foreground and require <i>real time</i> location updates (for example, a mapping app).</p> <p><b>Attachment 42 (Optimize location for battery) at 2.</b></p> <p><b>Traffic conditions</b> <a href="#">[ edit ]</a></p> <p>In 2007, Google began offering traffic data as a colored overlay on top of roads and motorways to represent the speed of vehicles on particular roads. <a href="#">Crowdsourcing</a> is used to obtain the GPS-determined locations of a large number of cellphone users, from which live traffic maps are produced.<sup>[59][60][61]</sup></p> <p>Google has stated that the speed and location information it collects to calculate traffic conditions is anonymous.<sup>[62]</sup> Options available in each phone's settings allow users not to share information about their location with Google Maps.<sup>[63]</sup> Google stated, "Once you disable or opt out of My Location, Maps will not continue to send radio information back to Google servers to determine your handset's approximate location".<sup>[64][failed verification]</sup></p> <p><b>Attachment 43 (Google Maps Wikipedia) at 5 &amp; 6.</b></p>

Claim 1	Corresponding Structure in Accused Systems
<p>according to mapping information stored within the wireless mobile communications device,</p>	<p>Plaintiff contends the Exhibit-B-listed mobile-wireless-communications device's motherboard processor is programmed to process location-service information; i.e., to receive a location of the device from the wireless communications network and generate an indication of the device's location.</p> <p>For example, the motherboard processor may use Google Maps to obtain the device's location and provide direction from that location to a destination. Wireless mobile communication device-including but not limited to Google's branded devices such as Google Pixel 5, pixel 4a 5G, pixel 4a, pixel 4 XL, pixel 4, pixel 3a XL, pixel 3a, pixel 3 XL, pixel 3, pixel 2, pixel 2 XL, pixel XL, pixel, pixel C or other (third-parties) branded devices such as Samsung Galaxy S20 Ultra, Galaxy S20 plus, Galaxy S20, Galaxy Z fold, Galaxy S10, Galaxy A series, etc. (refer Exhibit B for complete list) has a processor for example, Quad-Core processor. When wireless communication device transceivers and processor are in communication, they are coupled. Further, the Location-based Service (LBS) provider, such as Google Map, on the Exhibit-B utilizes the processor coupled to the transceiver to estimates/receive the location on mobile wireless communications devices (specifically one or more of the mobile wireless communications devices identified on Exhibit B) by utilizing wireless communication network or first computer.</p> <p>For example, the motherboard processor may use Google Maps to view and find places around the globe. Google map can also show your current location and provide direction (including with respect to geographic features such as nearby restaurants) from your location/source to any destination. In using Google Maps App, the mobile wireless communication device's motherboard processor generates signals for displaying on the device's screen a blue dot that shows the current location of the wireless mobile communication device. The Google map app estimates the location of the device from 3 sources: GPS (GPS uses satellites and knows your location within a few meters), Wi-Fi (the location of nearby Wi-Fi networks helps Maps know where you are), and cell towers (cell tower can be accurate up to a few thousand meters). When Google Maps isn't sure about your location, a light blue circle around the blue dot is shown. You might be anywhere within the light blue circle. The smaller the circle, the more certain the app is about your location.</p> <p>Furthermore, Plaintiff contends Google Maps App provides flexibility to download maps on SD card/internal memory of communication device (Exhibit B) examples of compatible devices is Samsung Galaxy S20, Pixel 4a, Pixel 4a 5G, Pixel 5, etc., and navigate offline. When internet is slow or mobile data is expensive, or communication device cannot connect to internet, an area can be saved to phone or tablet (Exhibit B) from Google maps app and use it when offline. Communication device can use Offline maps for Navigation through the downloaded area without internet.</p> <p>The following exemplifies the existence of this limitation in Accused Systems:</p>

**Claim 1****Corresponding Structure in Accused Systems**

Google Pixel 4a

REVIEW

SPECIFICATIONS

READ OPINIONS

PICTURES

128GB 6GB RAM

ALL PRICES

Google Pixel 4a 5G

PREVIEW

SPECIFICATIONS

READ OPINIONS

PICTURES

128GB 6GB RAM

ALL PRICES

Google Pixel 5

REVIEW

SPECIFICATIONS

READ OPINIONS

PICTURES

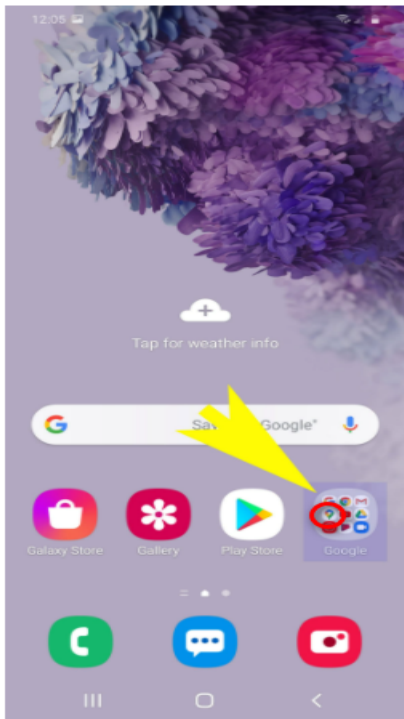
128GB 8GB RAM

ALL PRICES

Preloaded application Google Map on the Wireless mobile device utilizes the processor coupled to the transceiver to estimates/receive the location on mobile wireless communications device by utilizing wireless communication network



NETWORK	Technology	GSM / HSPA / LTE	GSM / HSPA / LTE / 5G	GSM / CDMA / HSPA / EVDO / LTE / 5G
LAUNCH	Announced Status	2020, August 03 Available. Released 2020, August 20	2020, September 30 Available. Released 2020, November 05	2020, September 30 Available. Released 2020, October 15
BODY	Dimensions	144 x 69.4 x 8.2 mm (5.67 x 2.73 x 0.32 in)	153.9 x 74 x 8.2 mm (Sub-6) or 8.5 mm (Sub-6 and mmWave)	144.7 x 70.4 x 8 mm (5.70 x 2.77 x 0.31 in)
	Weight	143 g (5.04 oz)	168 g (5G Sub-6); 171 g ( 5G Sub-6 and mmWave) (5.93 oz)	151 g (5.33 oz)
	Build	Glass front (Gorilla Glass 3), plastic back, plastic frame	Glass front (Gorilla Glass 3), plastic back, plastic frame	Glass front (Gorilla Glass 6), aluminum back, aluminum frame
	SIM	Nano-SIM and/or eSIM	Nano-SIM and/or eSIM	Nano-SIM and/or eSIM IP68 dust/water resistant (up to 1.5m for 30 mins)
DISPLAY	Type	OLED, HDR	OLED, HDR	OLED, 90Hz, HDR10+
	Size	5.81 inches, 83.2 cm <sup>2</sup> (~83.3% screen-to-body ratio)	6.2 inches, 95.7 cm <sup>2</sup> (~84.1% screen-to-body ratio)	6.0 inches, 87.6 cm <sup>2</sup> (~85.9% screen-to-body ratio)
	Resolution	1080 x 2340 pixels, 19.5:9 ratio (~443 ppi density)	1080 x 2340 pixels, 19.5:9 ratio (~413 ppi density)	1080 x 2340 pixels, 19.5:9 ratio (~432 ppi density)
	Protection	Corning Gorilla Glass 3 Always-on display	Corning Gorilla Glass 3 Always-on display	Corning Gorilla Glass 6 Always-on display
PLATFORM	OS	Android 10, upgradable to Android 11	Android 11	Android 11
	Chipset	Qualcomm SDM730 Snapdragon 730G (8 nm)	Qualcomm SM7250 Snapdragon 765G (7 nm)	Qualcomm SM7250 Snapdragon 765G (7 nm)
	CPU	Octa-core (2x2.2 GHz Kryo 470 Gold & 6x1.8 GHz Kryo 470 Silver)	Octa-core (1x2.4 GHz Kryo 475 Prime & 1x2.2 GHz Kryo 475 Gold & 6x1.8 GHz Kryo 475 Silver)	Octa-core (1x2.4 GHz Kryo 475 Prime & 1x2.2 GHz Kryo 475 Gold & 6x1.8 GHz Kryo 475 Silver)
	GPU	Adreno 618	Adreno 620	Adreno 620

**Attachment 4 (Processor of Google Pixel 4a, Pixel 4a 5G and Pixel 5) at 1.**

Claim 1	Corresponding Structure in Accused Systems
	<p data-bbox="386 254 1539 289">Using Turn-by-Turn Navigation with the Galaxy S20 Google Maps</p> <p data-bbox="386 310 659 333"><b>Time Needed</b> : 8 minutes</p> <p data-bbox="386 365 1539 417">The following steps demonstrate the actual process of setting up and utilizing turn-by-turn navigation system with the Google Maps app on the new Samsung Galaxy S20 handset.</p> <p data-bbox="386 420 1539 478">Before you begin, verify and ensure that location is enabled on your phone. It has to be enabled so that your device can determine your current location.</p> <p data-bbox="430 501 1052 525"><b>1. Tap to open the Google folder from the Home screen.</b></p> <p data-bbox="451 527 1273 550">A new screen consisting of Google-related apps and services will be displayed.</p> <div data-bbox="451 577 852 1291">  <p>The screenshot shows a home screen with a purple floral wallpaper. At the top, there is a weather widget with a plus icon and the text 'Tap for weather info'. Below the widget is a Google search bar. Underneath the search bar is a folder containing four icons: Galaxy Store, Gallery, Play Store, and Google. A yellow arrow points to the Google icon in this folder. At the bottom of the screen are three dock icons: Phone, Messages, and Camera. The navigation bar at the very bottom shows three icons: a square, a circle, and a triangle.</p> </div> <p data-bbox="922 697 1425 816">Google Maps preloaded in the Wireless mobile communication devices (Exhibit B), such as Galaxy S20. Current location of the device is determined if location is enabled.</p> <p data-bbox="375 1323 1084 1356"><b>Attachment 5 (how to use turn by turn Google map) at 1.</b></p>

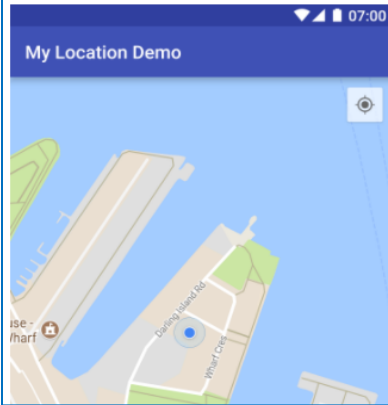


Claim 1	Corresponding Structure in Accused Systems
	<div data-bbox="425 233 799 646"> </div> <p data-bbox="406 674 1052 701">2. Tap Maps to open Google Maps app.</p> <p data-bbox="425 701 1403 751">If this is the first time you use Google Maps on your Galaxy S20, you'll be prompted with a Welcome screen. If you see this screen, read and review the information then tap <b>GOT IT</b> to proceed.</p> <div data-bbox="425 774 799 1268"> </div> <div data-bbox="922 850 1492 974"> <p>Google Maps preloaded in the Wireless mobile communication devices (Exhibit B), such as Galaxy S20.</p> </div> <p data-bbox="375 1287 1115 1318"><b>Attachment 5 (how to use turn by turn google map) at 2&amp;3.</b></p>

Claim 1	Corresponding Structure in Accused Systems
	<div data-bbox="397 241 662 310">  </div> <div data-bbox="1193 241 1469 294"> <a href="#">Personal</a> <a href="#">Business</a>  <a href="#">Shop</a> <a href="#">Why Verizon</a> <a href="#">Support</a> </div> <div data-bbox="397 367 998 388"> <a href="#">Home</a> &gt; <a href="#">Support</a> &gt; <a href="#">Sony</a> &gt; <a href="#">Sony Xperia Z2</a> &gt; <b>Google Maps - Find Current Location</b> </div> <div data-bbox="397 415 1347 504"> <h2>Google Maps™ - Find Current Location</h2> </div> <div data-bbox="397 520 487 546"> <p>Notes:</p> </div> <div data-bbox="397 562 1307 640"> <ul style="list-style-type: none"> <li>If the Google Maps app isn't already installed on your device, it can be <a href="#">downloaded</a> from the Google Play Store™.</li> <li>For further assistance, refer to the Google Maps <a href="#">Help Center</a>.</li> </ul> </div> <div data-bbox="397 682 941 787"> <ol style="list-style-type: none"> <li>From a Home screen, tap <b>Apps</b>.</li> <li>Tap <b>Maps</b>.</li> <li>Tap the <b>My Location icon</b> (located in the lower-right).</li> </ol> </div> <div data-bbox="982 619 1518 808"> <p>Wireless communication networks (e.g. Verizon, AT&amp;T, T-Mobile, etc.) estimate/determine the location of the Wireless communication device (Exhibit B) on Google Maps.</p> </div> <p><b>Attachment 6 (Find Current Location on Google map) at 1.</b></p> <div data-bbox="397 924 1502 1239">  <input type="text" value="Search Google Maps Help"/> <h3>How Maps finds your current location</h3> <p>Maps estimates where you are from sources like:</p> <ul style="list-style-type: none"> <li><b>GPS:</b> This uses satellites and knows your location within a few meters.</li> <li><b>Wi-Fi:</b> The location of nearby Wi-Fi networks helps Maps know where you are.</li> <li><b>Cell tower:</b> Your connection to a cellular network can be accurate up to a few thousand meters.</li> </ul> </div> <p><b>Attachment 8 (How map finds your current location) at 2.</b></p> <div data-bbox="397 1323 1469 1648"> <h3>What the blue dot means</h3> <p>The blue dot shows you where you are on the map. When Google Maps isn't sure about your location, you'll see a light blue circle around the blue dot. You might be anywhere within the light blue circle. The smaller the circle, the more certain the app is about your location.</p> <p>Notes:</p> <ul style="list-style-type: none"> <li>If the blue dot is not showing, or the dot is gray, this means that we can't find your current location and we're showing you the last location you visited.</li> <li>If there's something between you and cell towers, like a parking garage or tall buildings, your blue dot might not be accurate.</li> </ul> </div> <p><b>Attachment 8 (Current location shown on google map) at 3.</b></p>

**Claim 1****Corresponding Structure in Accused Systems**

The following screenshot shows the My Location button at top right and the My Location blue dot in the center of the map:



Blue Dot indicating location the map

Processor of the wireless communication device estimated the location of the wireless communication device (Exhibit B) from wireless communication network. The Blue dot showing estimated location.

Geographical features cities, streets, etc., on Google Maps

**Source:** Location estimation on the Wireless communication device

**Attachment 22 (Location estimation on the Wireless communication device) at 10.**

## Google Pixel 4a - Support Overview

Find device-specific support and online tools for your Google Pixel 4a.

Select another device			
<b>Activate and setup</b> Activate Pixel 4a Top 10 things to do with your new smartphone	<b>Popular topics</b> Interactive simulator Transfer contacts & media Find my phone	<b>Google info</b> The Google Pixel Phone Help Center provides additional support for your phone.	<b>Troubleshoot Pixel 4a</b> This online tool will help you identify and resolve problems with your device.

### Filter all topics below.

Select a category  
 Select a topic or type to search  
**GPS & Location Based Services**

## GPS & Location Based Services

### E911 Compliance FAQs

Review information about calling 911 from your mobile phone.

### GPS Location Settings - Android™

Here's how to view / change GPS location settings, which can affect battery life and location accuracy.

### Google Maps™ - Add Layers

Here's how to add layers in Google Maps.

### Google Maps™ - Download an Offline Map

If you can't get online or want to avoid global data charges while traveling, here's how to download a map.

### Google Maps™ - Find Current Location

Here's how to find your current location in Google Maps.

### Google Maps™ - Find Driving Directions


Here's how to find driving directions with Google Maps.

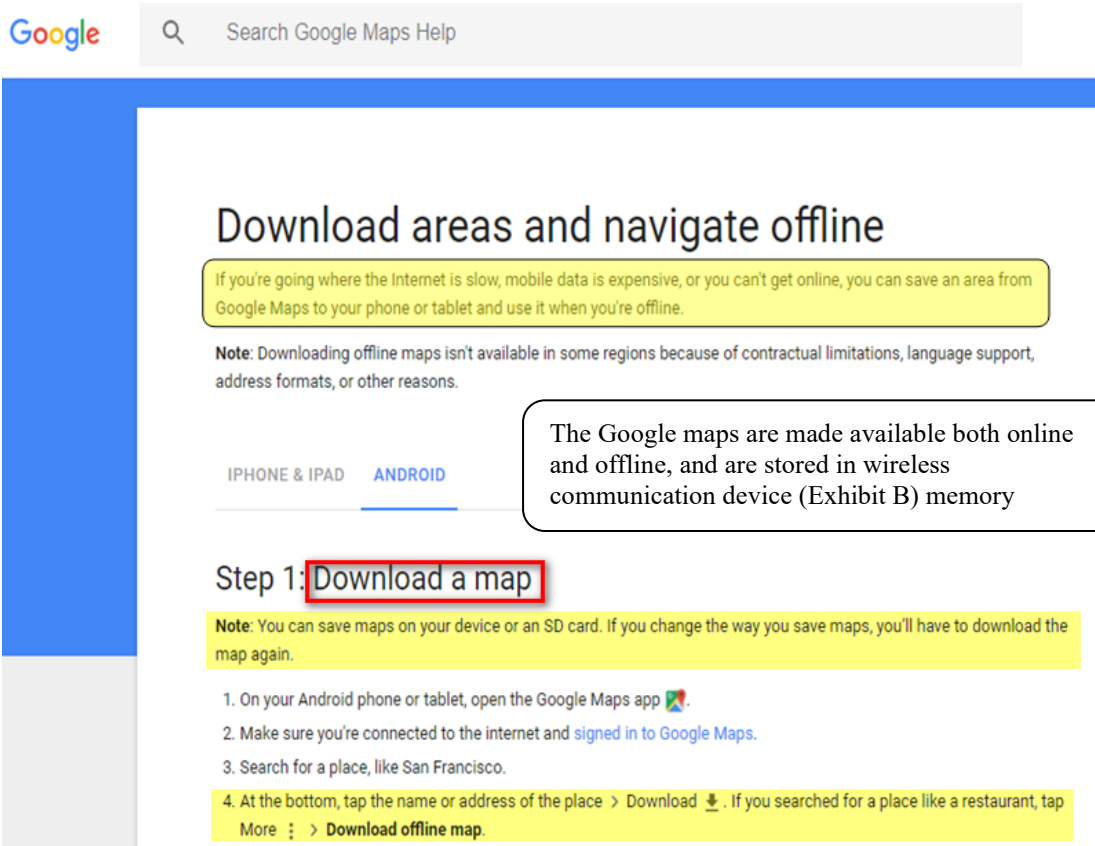
### Google Pixel 4a - Turn GPS Location On / Off

Here's how to turn GPS location for your Pixel 4a on or off.





### Improving GPS Performance






Here's info on improving GPS performance on your device.

Claim 1	Corresponding Structure in Accused Systems
	<p>Attachment 16 (How to use Pixel 4a GPS and location-based services) at 9.</p>  <p>The Google maps are made available both online and offline, and are stored in wireless communication device (Exhibit B) memory</p> <p>Attachment 10 (Google Map-Download an offline map on pixel 4a) at 1.</p>

Claim 1	Corresponding Structure in Accused Systems
	 <p><b>Download areas and navigate offline</b></p> <p>If you're going where the Internet is slow, mobile data is expensive, or you can't get online, you can save an area from Google Maps to your phone or tablet and use it when you're offline.</p> <p><b>Note:</b> Downloading offline maps isn't available in some regions because of contractual limitations, language support, address formats, or other reasons.</p> <p>IPHONE &amp; IPAD <b>ANDROID</b></p> <p><b>Step 1: Download a map</b></p> <p><b>Note:</b> You can save maps on your device or an SD card. If you change the way you save maps, you'll have to download the map again.</p> <ol style="list-style-type: none"> <li>1. On your Android phone or tablet, open the Google Maps app.</li> <li>2. Make sure you're connected to the internet and <a href="#">signed in to Google Maps</a>.</li> <li>3. Search for a place, like San Francisco.</li> <li>4. At the bottom, tap the name or address of the place &gt; Download . If you searched for a place like a restaurant, tap More &gt; Download offline map.</li> </ol> <p><b>Attachment 9 (Mapping information stored on wireless communication device) at 1.</b></p>



Claim 1	Corresponding Structure in Accused Systems
	<p><b>Save a route</b></p> <ol style="list-style-type: none"> <li>1. On your Android phone or tablet, open the Google Maps app .</li> <li>2. Make sure you're connected to the Internet.</li> <li>3. Search for your destination or tap it on the map.</li> <li>4. In the bottom left, tap Directions .</li> <li>5. From the top, choose your mode of transit.</li> <li>6. Tap the white bar at the bottom. It's the one that shows the travel time and distance.</li> <li>7. At the bottom, tap <b>Save offline</b>.</li> </ol> <p>Tip:</p> <ul style="list-style-type: none"> <li>• Your route is saved on your phone or tablet. Make sure to use the same phone or tablet when looking for a saved route.</li> <li>• <b>Your saved route expires after 30 days.</b></li> <li>• Your route will show you the same mode of transit you chose when you saved the route.</li> </ul> <p><b>Find a saved route</b></p> <ol style="list-style-type: none"> <li>1. On your Android phone or tablet, open the <b>Google Maps app</b> .</li> <li>2. At the bottom, tap <b>Saved offline route</b>.</li> </ol> <p>Tip:</p> <ul style="list-style-type: none"> <li>• If you save a route from "Your location" and look up a saved route, the directions will start from the place where you saved the route. The directions won't start from your current location.</li> <li>• <b>To get updated information like traffic, tap Refresh</b> .</li> <li>• Turn-by-turn navigation isn't currently available for saved routes. To search for places and get turn-by-turn navigation, download an offline area.</li> </ul> <p><b>Attachment 32 (Get directions &amp; show routes) at 3.</b></p>

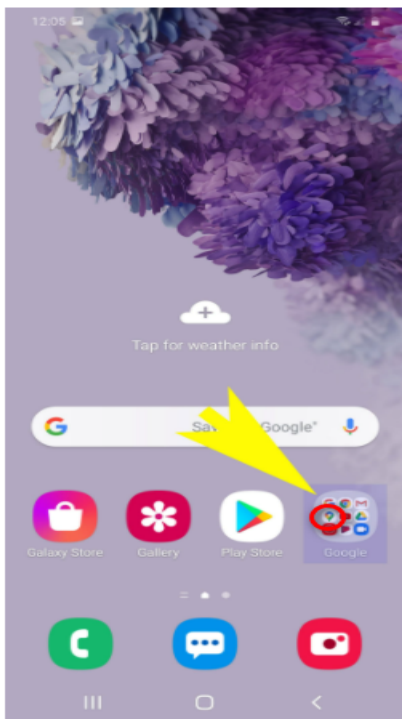
Claim 1	Corresponding Structure in Accused Systems
	<p><b>Use offline maps</b></p> <p>After you download an area, use the Google Maps app just like you normally would.</p> <ul style="list-style-type: none"> <li>• <a href="#">Get directions and see routes</a></li> <li>• <a href="#">Use navigation</a></li> <li>• <a href="#">Search for locations</a></li> </ul> <p>If your Internet connection is slow or absent, Google Maps will use your offline maps to give you directions.</p> <p>Notes:</p> <ul style="list-style-type: none"> <li>• You can get driving directions offline, but not transit, bicycling, or walking directions. In your driving directions, you won't have traffic info, alternate routes, or lane guidance.</li> <li>• To save cell data and battery life, use "Wi-Fi only" mode. In this mode, when you're not connected to Wi-Fi, Google Maps will only use data from the offline maps that you've downloaded. Before you use this mode, make sure you download offline maps. To turn on this mode, tap your profile picture or initial  &gt; Settings  &gt; turn on Wi-Fi only.</li> </ul> <p><b>Manage offline maps</b></p> <hr/> <p><a href="#">See a list of your offline maps</a> </p> <ol style="list-style-type: none"> <li>1. On your Android phone or tablet, open the Google Maps app .</li> <li>2. Tap your profile picture or initial  &gt; <b>Offline maps</b>.</li> </ol> <p>You can select your own map to download, or <b>view maps you've already downloaded.</b></p> <p><b>Attachment 31 (Download google map) at 2.</b></p>
<p>and wherein the first processor determines user navigation information and displays the user navigation information according to the location of the wireless mobile communications device with respect to the geographic features and a destination specified at the wireless mobile communications device,</p>	<p>Plaintiff contends the motherboard processor (i.e., processor on the motherboard) of each Exhibit-B-listed item (i.e., mobile Wireless communications device) meets this limitation. The processor processes location-service information, including displaying user navigation information according to the device's location with regards to geographic features and a user-specified Destination. For example, using Google map app for more examples of location services processed by each Exhibit-B device's motherboard processor) the device user locates the device's current location on the google map app and then provide details for a destination on the options, provided in the Google map app. The user can then navigate (i.e., the processor processes display information) in real time from current location to destination. The processor displays navigation in the Google Maps app to display turn-by-turn directions. Using the Google map app, the processor will show the directions and use real-time traffic information to find the best route to the specified destination.</p> <p>The following exemplifies this limitation's existence in Accused Systems:</p>

**Claim 1****Corresponding Structure in Accused Systems**



Preloaded application Google Map on the Wireless mobile device utilizes the processor coupled to the transceiver to estimates/receive the location on mobile wireless communications device by utilizing wireless communication network

NETWORK	Technology	GSM / HSPA / LTE	GSM / HSPA / LTE / 5G	GSM / CDMA / HSPA / EVDO / LTE / 5G
LAUNCH	Announced	2020, August 03	2020, September 30	2020, September 30
	Status	Available. Released 2020, August 20	Available. Released 2020, November 05	Available. Released 2020, October 15
BODY	Dimensions	144 x 69.4 x 8.2 mm (5.67 x 2.73 x 0.32 in)	153.9 x 74 x 8.2 mm (Sub-6) or 8.5 mm (Sub-6 and mmWave)	144.7 x 70.4 x 8 mm (5.70 x 2.77 x 0.31 in)
	Weight	143 g (5.04 oz)	168 g (5G Sub-6); 171 g (5G Sub-6 and mmWave) (5.93 oz)	151 g (5.33 oz)
	Build	Glass front (Gorilla Glass 3), plastic back, plastic frame	Glass front (Gorilla Glass 3), plastic back, plastic frame	Glass front (Gorilla Glass 6), aluminum back, aluminum frame
	SIM	Nano-SIM and/or eSIM	Nano-SIM and/or eSIM	Nano-SIM and/or eSIM
DISPLAY	Type	OLED, HDR	OLED, HDR	OLED, 90Hz, HDR10+
	Size	5.81 inches, 83.2 cm <sup>2</sup> (~83.3% screen-to-body ratio)	6.2 inches, 95.7 cm <sup>2</sup> (~84.1% screen-to-body ratio)	6.0 inches, 87.6 cm <sup>2</sup> (~85.9% screen-to-body ratio)
	Resolution	1080 x 2340 pixels, 19.5:9 ratio (~443 ppi density)	1080 x 2340 pixels, 19.5:9 ratio (~413 ppi density)	1080 x 2340 pixels, 19.5:9 ratio (~432 ppi density)
	Protection	Corning Gorilla Glass 3	Corning Gorilla Glass 3	Corning Gorilla Glass 6
		Always-on display	Always-on display	Always-on display
PLATFORM	OS	Android 10, upgradable to Android 11	Android 11	Android 11
	Chipset	Qualcomm SDM730 Snapdragon 730G (8 nm)	Qualcomm SM7250 Snapdragon 765G (7 nm)	Qualcomm SM7250 Snapdragon 765G (7 nm)
	CPU	Octa-core (2x2.2 GHz Kryo 470 Gold & 6x1.8 GHz Kryo 470 Silver)	Octa-core (1x2.4 GHz Kryo 475 Prime & 1x2.2 GHz Kryo 475 Gold & 6x1.8 GHz Kryo 475 Silver)	Octa-core (1x2.4 GHz Kryo 475 Prime & 1x2.2 GHz Kryo 475 Gold & 6x1.8 GHz Kryo 475 Silver)
	GPU	Adreno 618	Adreno 620	Adreno 620

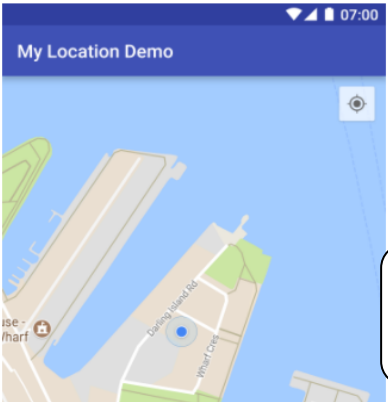
**Attachment 4 (Processor of Google Pixel 4a, Pixel 4a 5G, and Pixel 5) at 1.**

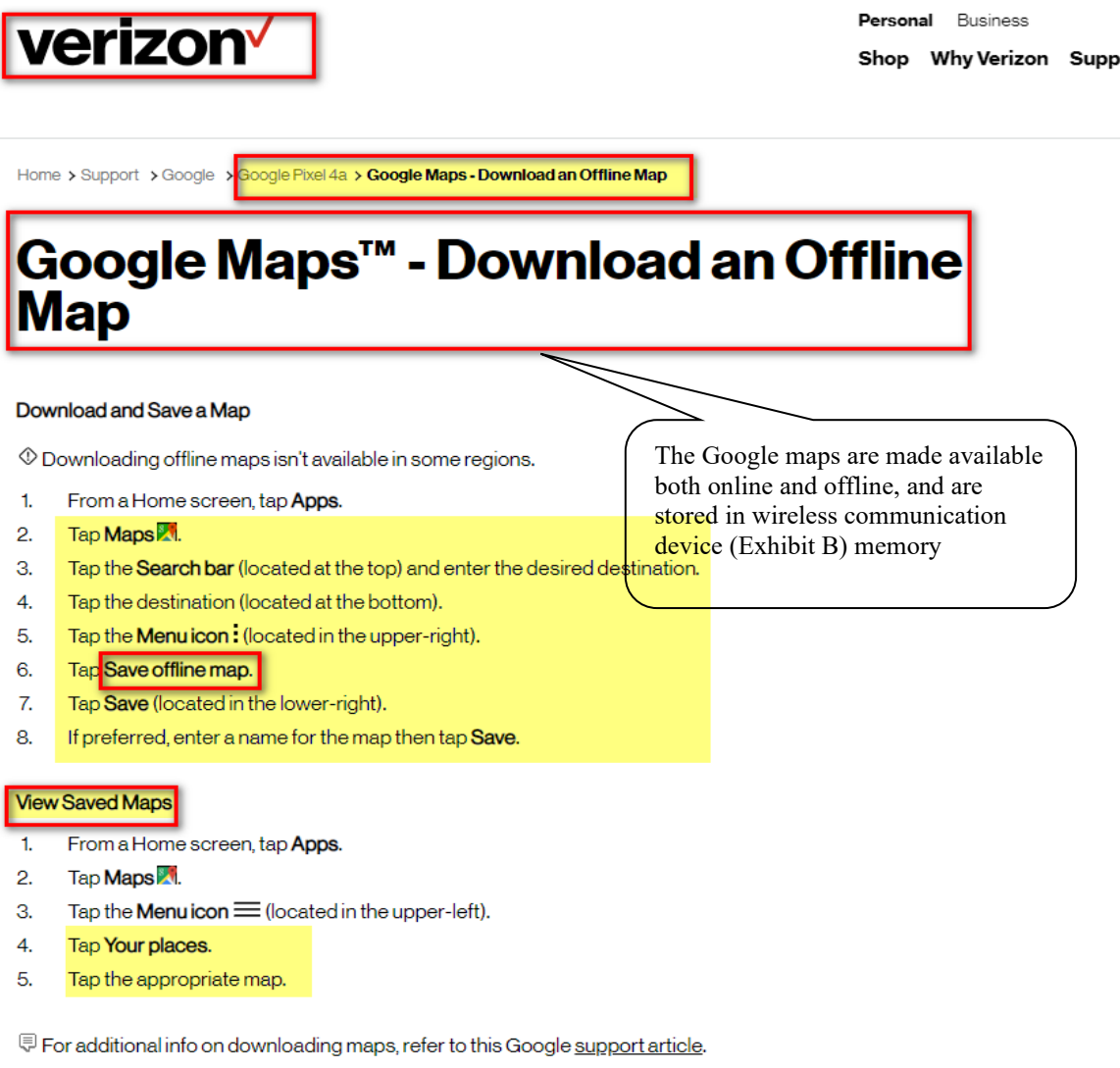
Claim 1	Corresponding Structure in Accused Systems
	<p data-bbox="386 254 1536 289">Using Turn-by-Turn Navigation with the Galaxy S20 Google Maps</p> <p data-bbox="386 310 659 333"><b>Time Needed</b> : 8 minutes</p> <p data-bbox="386 365 1536 417">The following steps demonstrate the actual process of setting up and utilizing turn-by-turn navigation system with the Google Maps app on the new Samsung Galaxy S20 handset.</p> <p data-bbox="386 420 1536 472">Before you begin, verify and ensure that location is enabled on your phone. It has to be enabled so that your device can determine your current location.</p> <p data-bbox="431 501 1052 525"><b>1. Tap to open the Google folder from the Home screen.</b></p> <p data-bbox="453 527 1273 550">A new screen consisting of Google-related apps and services will be displayed.</p> <div data-bbox="451 575 850 1289">  <p>The screenshot shows a home screen with a purple floral wallpaper. At the top, there's a weather widget with a plus icon and the text 'Tap for weather info'. Below that is a Google search bar. Under the search bar is a folder labeled 'Google' containing icons for Galaxy Store, Gallery, Play Store, and Google Maps. A yellow arrow points to the Google Maps icon within this folder. At the bottom are icons for Phone, Messages, and Camera, and a dock with three dots, a square, and a back arrow.</p> </div> <p data-bbox="922 680 1429 798">Google Maps preloaded in the Wireless mobile communication devices (Exhibit B), such as Galaxy S20. Current location of the device is determined if location is enabled</p> <p data-bbox="375 1323 1084 1354"><b>Attachment 5 (how to use turn by turn Google map) at 1.</b></p>

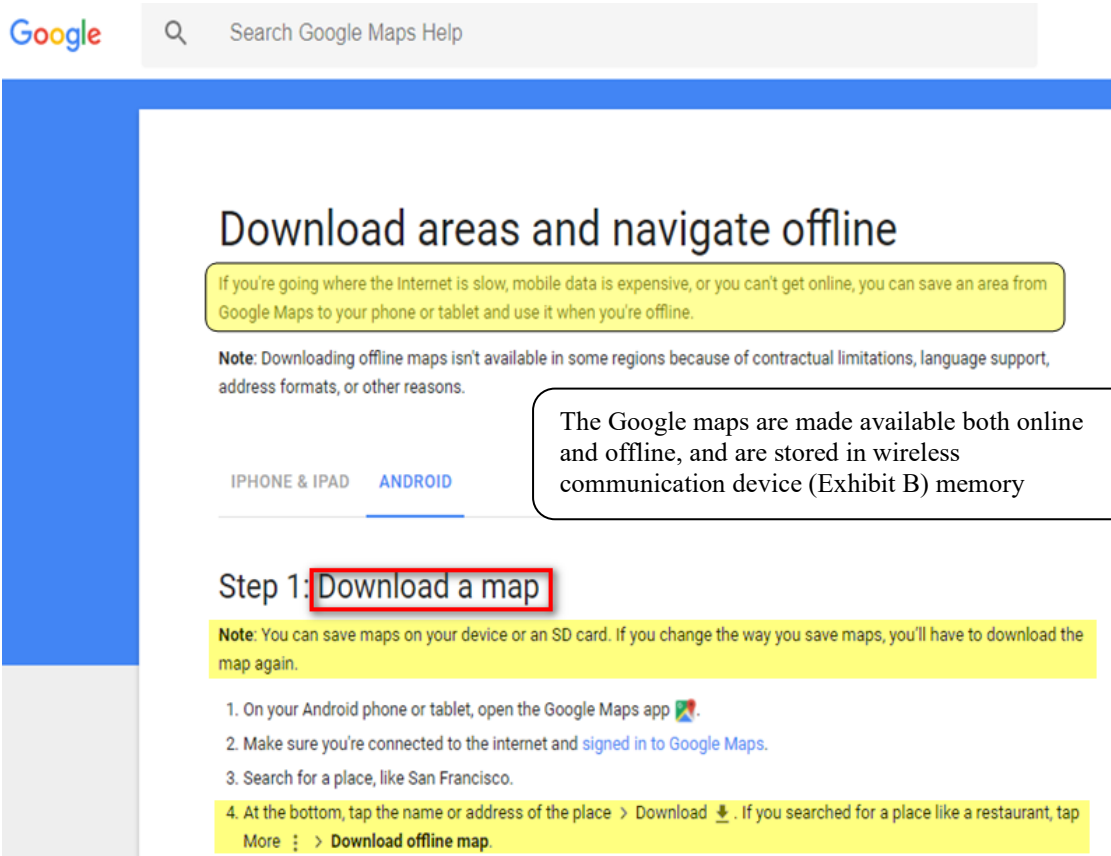
Claim 1	Corresponding Structure in Accused Systems
	<div data-bbox="425 233 799 646"> </div> <p data-bbox="406 674 1052 701">2. <b>Tap Maps to open Google Maps app.</b></p> <p data-bbox="425 701 1403 751">If this is the first time you use Google Maps on your Galaxy S20, you'll be prompted with a Welcome screen. If you see this screen, read and review the information then tap <b>GOT IT</b> to proceed.</p> <div data-bbox="425 774 799 1266"> </div> <div data-bbox="922 850 1492 974"> <p>Google Maps preloaded in the Wireless mobile communication devices (Exhibit B), such as Galaxy S20.</p> </div> <p data-bbox="375 1287 1115 1318"><b>Attachment 5 (how to use turn by turn google map) at 2&amp;3.</b></p>













Claim 1	Corresponding Structure in Accused Systems
	<div data-bbox="397 241 662 310">  </div> <div data-bbox="1193 237 1466 294"> <a href="#">Personal</a> <a href="#">Business</a>  <a href="#">Shop</a> <a href="#">Why Verizon</a> <a href="#">Support</a> </div> <div data-bbox="402 369 992 388"> <a href="#">Home</a> &gt; <a href="#">Support</a> &gt; <a href="#">Sony</a> &gt; <a href="#">Sony Xperia Z2</a> &gt; <b>Google Maps - Find Current Location</b> </div> <div data-bbox="402 426 1333 476"> <h2>Google Maps™ - Find Current Location</h2> </div> <div data-bbox="402 520 487 541"> <p>Notes:</p> </div> <div data-bbox="402 560 1308 636"> <ul style="list-style-type: none"> <li>If the Google Maps app isn't already installed on your device, it can be <a href="#">downloaded</a> from the Google Play Store™.</li> <li>For further assistance, refer to the Google Maps <a href="#">Help Center</a>.</li> </ul> </div> <div data-bbox="402 680 906 762"> <ol style="list-style-type: none"> <li>From a Home screen, tap <b>Apps</b>.</li> <li>Tap <b>Maps</b>.</li> <li>Tap the <b>My Location icon</b> (located in the lower-right).</li> </ol> </div> <div data-bbox="982 619 1463 772"> <p>Wireless communication networks (e.g. Verizon, AT&amp;T, T-Mobile, etc.) estimate/determine the location of the Wireless communication device (Exhibit B) on Google Maps.</p> </div> <p><b>Attachment 6 (Find Current Location on Google map) at 1.</b></p> <div data-bbox="394 932 529 972">  </div> <div data-bbox="609 932 1027 968"> <input type="text" value="Search Google Maps Help"/> </div> <div data-bbox="428 1018 1122 1060"> <h3>How Maps finds your current location</h3> </div> <div data-bbox="428 1077 922 1102"> <p>Maps estimates where you are from sources like:</p> </div> <div data-bbox="428 1123 1401 1220"> <ul style="list-style-type: none"> <li><b>GPS:</b> This uses satellites and knows your location within a few meters.</li> <li><b>Wi-Fi:</b> The location of nearby Wi-Fi networks helps Maps know where you are.</li> <li><b>Cell tower:</b> Your connection to a cellular network can be accurate up to a few thousand meters.</li> </ul> </div> <p><b>Attachment 8 (How map finds your current location) at 2.</b></p> <div data-bbox="402 1318 808 1352"> <h4>What the blue dot means</h4> </div> <div data-bbox="402 1369 1466 1444"> <p>The blue dot shows you where you are on the map. When Google Maps isn't sure about your location, you'll see a light blue circle around the blue dot. You might be anywhere within the light blue circle. The smaller the circle, the more certain the app is about your location.</p> </div> <div data-bbox="402 1465 467 1486"> <p>Notes:</p> </div> <div data-bbox="402 1507 1440 1614"> <ul style="list-style-type: none"> <li>If the blue dot is not showing, or the dot is gray, this means that we can't find your current location and we're showing you the last location you visited.</li> <li>If there's something between you and cell towers, like a parking garage or tall buildings, your blue dot might not be accurate.</li> </ul> </div> <p><b>Attachment 8 (Current location shown on google map) at 3.</b></p>



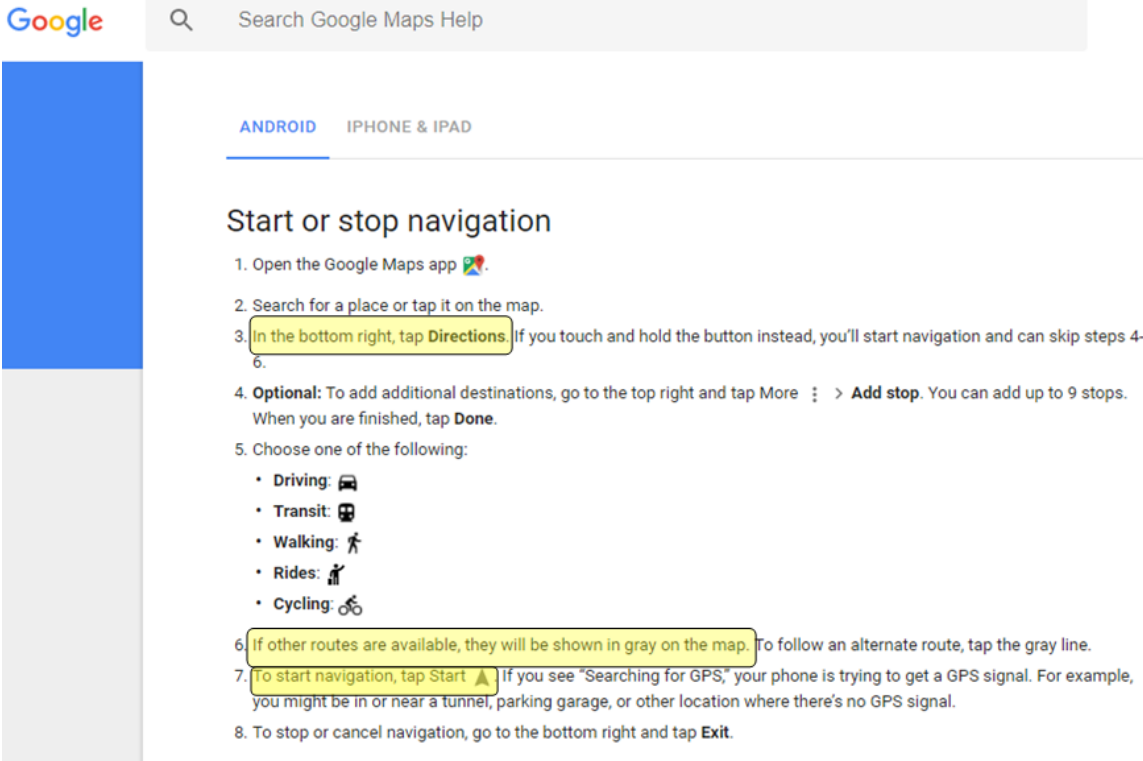
Claim 1	Corresponding Structure in Accused Systems
	<p data-bbox="386 247 1485 310">The following screenshot shows the My Location button at top right and the My Location blue dot in the center of the map:</p>  <p data-bbox="803 300 1201 331">Blue Dot indicating location the map</p> <p data-bbox="803 373 1263 525">Processor of the wireless communication device estimate the location of the wireless communication device (Exhibit B) from wireless communication network. The Blue dot showing estimated location.</p> <p data-bbox="792 594 1409 625">Geographical features cities, streets, etc., on Google Maps</p> <p data-bbox="375 756 1172 787"><b>Source:</b> Location estimation on the Wireless communication device</p> <p data-bbox="375 804 1393 835"><b>Attachment 22 (Location estimation on the Wireless communication device) at 10.</b></p>

Claim 1	Corresponding Structure in Accused Systems
	 <p><b>verizon</b></p> <p>Personal Business Shop Why Verizon Support</p> <p>Home &gt; Support &gt; Google &gt; Google Pixel 4a &gt; Google Maps - Download an Offline Map</p> <h2>Google Maps™ - Download an Offline Map</h2> <p><b>Download and Save a Map</b></p> <p>◇ Downloading offline maps isn't available in some regions.</p> <ol style="list-style-type: none"> <li>1. From a Home screen, tap <b>Apps</b>.</li> <li>2. Tap <b>Maps</b>.</li> <li>3. Tap the <b>Search bar</b> (located at the top) and enter the desired destination.</li> <li>4. Tap the destination (located at the bottom).</li> <li>5. Tap the <b>Menu icon</b> (located in the upper-right).</li> <li>6. Tap <b>Save offline map</b>.</li> <li>7. Tap <b>Save</b> (located in the lower-right).</li> <li>8. If preferred, enter a name for the map then tap <b>Save</b>.</li> </ol> <p><b>View Saved Maps</b></p> <ol style="list-style-type: none"> <li>1. From a Home screen, tap <b>Apps</b>.</li> <li>2. Tap <b>Maps</b>.</li> <li>3. Tap the <b>Menu icon</b> (located in the upper-left).</li> <li>4. Tap <b>Your places</b>.</li> <li>5. Tap the appropriate map.</li> </ol> <p>For additional info on downloading maps, refer to this <a href="#">Google support article</a>.</p> <p>The Google maps are made available both online and offline, and are stored in wireless communication device (Exhibit B) memory</p> <p><b>Attachment 10 (Google Map-Download an offline map on Pixel 4a) at 1.</b></p>

Claim 1	Corresponding Structure in Accused Systems
	 <p><b>Download areas and navigate offline</b></p> <p>If you're going where the Internet is slow, mobile data is expensive, or you can't get online, you can save an area from Google Maps to your phone or tablet and use it when you're offline.</p> <p><b>Note:</b> Downloading offline maps isn't available in some regions because of contractual limitations, language support, address formats, or other reasons.</p> <p>IPHONE &amp; IPAD <b>ANDROID</b></p> <p><b>Step 1: Download a map</b></p> <p><b>Note:</b> You can save maps on your device or an SD card. If you change the way you save maps, you'll have to download the map again.</p> <ol style="list-style-type: none"> <li>1. On your Android phone or tablet, open the Google Maps app.</li> <li>2. Make sure you're connected to the internet and <a href="#">signed in to Google Maps</a>.</li> <li>3. Search for a place, like San Francisco.</li> <li>4. At the bottom, tap the name or address of the place &gt; Download . If you searched for a place like a restaurant, tap More &gt; Download offline map.</li> </ol> <p><b>Attachment 9 (Mapping information stored on wireless communication device) at 1.</b></p>

Claim 1	Corresponding Structure in Accused Systems
	<p data-bbox="391 222 1024 268"><b>Get directions &amp; show routes</b></p> <p data-bbox="391 281 1422 331">You can get directions for driving, public transit, walking, or biking on Google Maps. Whenever you find multiple routes, the best route to your destination is blue. Other routes are in gray on the map.</p> <p data-bbox="391 348 1433 449">Some directions in Google Maps are in beta, and may have limited availability. Always be cautious when using directions on Google Maps, remain aware of your surroundings at all times, and take necessary means to ensure safety of yourself and those around you. When in doubt, follow actual traffic regulations by confirming signage from the road or path that you are on when using directions.</p> <p data-bbox="410 510 805 531"> <a href="#">Android</a>   Computer   iPhone &amp; iPad </p> <hr/> <ol data-bbox="399 600 1013 919" style="list-style-type: none"> <li>1. On your Android phone or tablet, open the Google Maps app .</li> <li>2. Search for your destination or tap it on the map.</li> <li>3. In the bottom left, tap Directions .</li> <li>4. Choose one of the following: <ul style="list-style-type: none"> <li>• Driving: </li> <li>• Motorcycle: </li> <li>• Transit: </li> <li>• Walking: </li> <li>• Rides: </li> <li>• Cycling: </li> </ul> </li> <li>5. To get the list of directions, tap the bar at the bottom that <b>shows travel time and distance</b>.</li> <li>6. To choose another route, tap it on the map. <b>Each route shows the estimated travel time on the map.</b></li> </ol> <p data-bbox="391 1010 428 1031">Tip:</p> <ul data-bbox="399 1052 1430 1161" style="list-style-type: none"> <li>• For transit directions, choose a route, then tap the bar at the bottom that shows travel time and distance.</li> <li>• Not all cities have public transit directions in Google Maps. <a href="#">Learn which cities are covered</a> .</li> <li>• For Driving  and Transit  directions, to pin your favorite trips, tap Pin  at the bottom. <a href="#">Learn more about how to pin your favorite trips</a>.</li> </ul> <p data-bbox="375 1199 1008 1230"><b>Attachment 32 (Get directions &amp; show routes) at 3.</b></p>

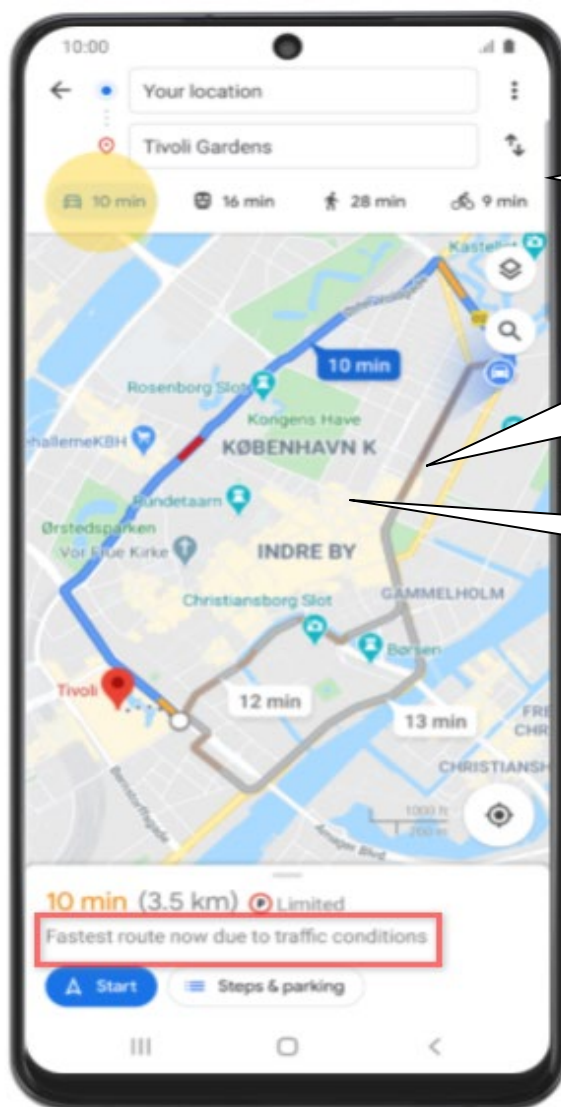
Claim 1	Corresponding Structure in Accused Systems
	<p data-bbox="386 237 1421 321">4. <b>Tap the Choose destination field to specify your target location as a travel destination.</b> On the next screen, simply type in the name of the place where you'd like to travel to. If prompted, select the correct location from the search result.</p> <div data-bbox="410 342 824 688"> </div> <div data-bbox="873 352 1414 489"> <p>Navigation Information displayed to user based on destination entered on the Wireless communication device (Exhibit B).</p> </div> <p data-bbox="386 709 1421 762">5. <b>After entering your destination, tap the Start button at the bottom-left corner of the screen.</b> That should prompt the app to start giving turn by turn navigation instructions.</p> <div data-bbox="410 783 800 1339"> </div> <div data-bbox="873 762 1284 867"> <p>Current location and destination location on the map</p> </div> <div data-bbox="911 982 1308 1108"> <p>Geographical features cities, streets, or other point of interests, etc.</p> </div> <div data-bbox="938 1171 1263 1287"> <p>Estimate time to reach the destination</p> </div> <p data-bbox="375 1360 1398 1392"><b>Attachment 5 (Navigation based on destination entered on Google Maps) at 4 &amp; 5.</b></p>

Claim 1	Corresponding Structure in Accused Systems
	 <p><b>Attachment 11 (Navigation based on destination entered on Google Maps) at 1 &amp; 2.</b></p> <p><b>Use offline maps</b></p> <p>After you download an area, use the Google Maps app just like you normally would.</p> <ul style="list-style-type: none"> <li>• <a href="#">Get directions and see routes</a></li> <li>• <a href="#">Use navigation</a></li> <li>• <a href="#">Search for locations</a></li> </ul> <p>If your Internet connection is slow or absent, Google Maps will use your offline maps to give you directions.</p> <p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>• You can get driving directions offline, but not transit, bicycling, or walking directions. In your driving directions, you won't have traffic info, alternate routes, or lane guidance.</li> <li>• To save cell data and battery life, use "Wi-Fi only" mode. In this mode, when you're not connected to Wi-Fi, Google Maps will only use data from the offline maps that you've downloaded. Before you use this mode, make sure you download offline maps. To turn on this mode, tap your profile picture or initial &gt; Settings &gt; turn on Wi-Fi only.</li> </ul> <p><b>Manage offline maps</b></p> <p><a href="#">See a list of your offline maps</a></p> <ol style="list-style-type: none"> <li>1. On your Android phone or tablet, open the Google Maps app.</li> <li>2. Tap your profile picture or initial &gt; <b>Offline maps</b>.</li> </ol> <p>You can select your own map to download, or <b>view maps you've already downloaded.</b></p> <p><b>Attachment 31 (Download google map) at 2.</b></p>



## Claim 1

## Corresponding Structure in Accused Systems



Navigation Information displayed to user by the processor on the wireless communication device (Exhibit-B) based on destination entered by the user.

Navigation Information displayed to user based on destination entered on the Wireless communication device (Exhibit B).

Geographical features cities, streets, or other point of interests, etc.

Attachment 25 (Use Google Maps - Samsung Galaxy S20 Ultra 5G) at 6.

Claim 1	Corresponding Structure in Accused Systems
	<div data-bbox="548 233 1156 1247"> </div> <div data-bbox="1031 258 1477 378"> <p>Navigation Information displayed to user based on destination entered on the Wireless communication device (Exhibit B).</p> </div> <div data-bbox="1193 768 1497 798"> <p>Current location on the map</p> </div> <div data-bbox="1151 1003 1458 1092"> <p>Geographical features cities, streets, or other point of interests, etc.</p> </div> <p><b>Source:</b> Navigation based on destination entered on Google Maps</p>
<p>wherein the first processor further sends the user navigation information to the network as a number of segments, wherein at least one other processor outside the network updates the user navigation information in conformity with traffic congestion</p>	<p>Plaintiff contends each item listed on Exhibit B corresponds to this claim limitation because each Exhibit-B item includes a processor. Wireless mobile communication device- including but not limited to Google's branded devices such as Google Pixel 5, pixel 4a 5G, pixel 4a, pixel 4 XL, pixel 4, pixel 3a XL, pixel 3a, pixel 3 XL, pixel 3, pixel 2, pixel 2 XL, pixel XL, pixel, pixel C or other (third-parties) branded devices such as Samsung Galaxy S20 Ultra, Galaxy S20 plus, Galaxy S20, Galaxy Z fold, Galaxy S10, Galaxy A series, etc. (refer Exhibit B for complete list) has a processor, for example, Quad-Core/ Octa-core processor.</p> <p>Further, the Google Maps utilizing the processor can send the user navigation information to the network as a number of segments as to receive the traffic information for the segments, it is required to send the navigation information to the network as a number of segments.</p> <p>As can be seen from the citations, the wireless communications device (Exhibit-B), having a processor, while navigating keeps on communicating the navigation information to the wireless communication network. The Google Maps hardware/software in the wireless communication network computes the average speed (numerical value) or average delays for each segment based on traffic congestion information for each segment. The updated information in response to the user's current navigation information is then transmitted by Google Maps hardware/software to</p>

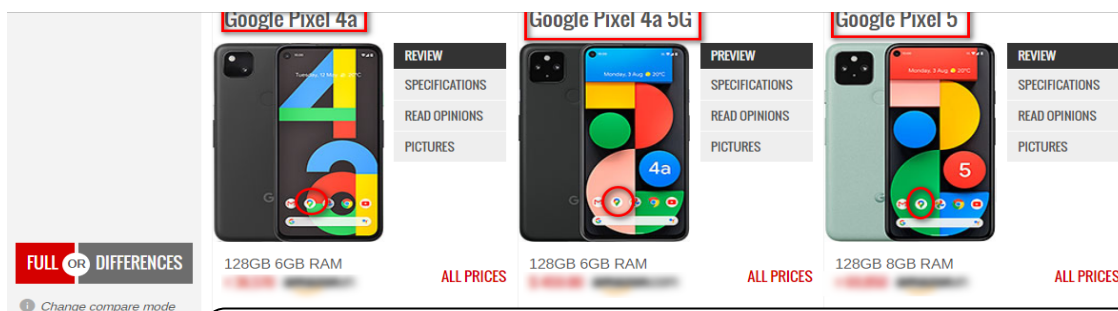
**Claim 1**

information accessible to the at least one other processor outside the network by computing a numerical value for the segments corresponding to the expected time to travel through the segments, updates the user navigation information in conformity with the numerical values for the segments, and sends the updated user navigation information to the wireless mobile communications device;

**Corresponding Structure in Accused Systems**

the wireless communication device (Exhibit-B). The Google Map provides the user of the wireless communication device with the delays from traffic, summary of incidents and the average speed of each segment on the traffic page and also provides the user with the suggested navigation information with the received traffic information. The suggested route screen shows the proposed new route, outlining the original and suggested route, as well as listing the estimated time saved.












The following exemplifies the existence of this limitation in Accused Systems:









Preloaded application Google Map on the Wireless mobile device utilizes the processor coupled to the transceiver to estimates/receive the location on mobile wireless communications device by utilizing wireless communication network

NETWORK	Technology	GSM / HSPA / LTE	GSM / HSPA / LTE / 5G	GSM / CDMA / HSPA / EVDO / LTE / 5G
LAUNCH	Announced	2020, August 03	2020, September 30	2020, September 30
	Status	Available. Released 2020, August 20	Available. Released 2020, November 05	Available. Released 2020, October 15
	Dimensions	144 x 69.4 x 8.2 mm (5.67 x 2.73 x 0.32 in)	153.9 x 74 x 8.2 mm (Sub-6) or 8.5 mm (Sub-6 and mmWave)	144.7 x 70.4 x 8 mm (5.70 x 2.77 x 0.31 in)
	Weight	143 g (5.04 oz)	168 g (5G Sub-6); 171 g (5G Sub-6 and mmWave) (5.93 oz)	151 g (5.33 oz)
BODY	Build	Glass front (Gorilla Glass 3), plastic back, plastic frame	Glass front (Gorilla Glass 3), plastic back, plastic frame	Glass front (Gorilla Glass 6), aluminum back, aluminum frame
	SIM	Nano-SIM and/or eSIM	Nano-SIM and/or eSIM	Nano-SIM and/or eSIM
	IP68 dust/water resistant (up to 1.5m for 30 mins)			
DISPLAY	Type	OLED, HDR	OLED, HDR	OLED, 90Hz, HDR10+
	Size	5.81 inches, 83.2 cm <sup>2</sup> (~83.3% screen-to-body ratio)	6.2 inches, 95.7 cm <sup>2</sup> (~84.1% screen-to-body ratio)	6.0 inches, 87.6 cm <sup>2</sup> (~85.9% screen-to-body ratio)
	Resolution	1080 x 2340 pixels, 19.5:9 ratio (~443 ppi density)	1080 x 2340 pixels, 19.5:9 ratio (~413 ppi density)	1080 x 2340 pixels, 19.5:9 ratio (~432 ppi density)
	Protection	Corning Gorilla Glass 3 Always-on display	Corning Gorilla Glass 3 Always-on display	Corning Gorilla Glass 6 Always-on display
PLATFORM	OS	Android 10, upgradable to Android 11	Android 11	Android 11
	Chipset	Qualcomm SDM730 Snapdragon 730G (8 nm)	Qualcomm SM7250 Snapdragon 765G (7 nm)	Qualcomm SM7250 Snapdragon 765G (7 nm)
	CPU	Octa-core (2x2.2 GHz Kryo 470 Gold & 6x1.8 GHz Kryo 470 Silver)	Octa-core (1x2.4 GHz Kryo 475 Prime & 1x2.2 GHz Kryo 475 Gold & 6x1.8 GHz Kryo 475 Silver)	Octa-core (1x2.4 GHz Kryo 475 Prime & 1x2.2 GHz Kryo 475 Gold & 6x1.8 GHz Kryo 475 Silver)
	GPU	Adreno 618	Adreno 620	Adreno 620

**Attachment 4 (Processor of Google Pixel 4a, Pixel 4a 5G and Pixel 5) at 1.**

Claim 1	Corresponding Structure in Accused Systems
	<div data-bbox="386 235 1026 285" data-label="Section-Header"> <h2>Get directions &amp; show routes</h2> </div> <div data-bbox="386 296 1414 346" data-label="Text"> <p>You can get directions for driving, public transit, walking, or biking on Google Maps. Whenever you find multiple routes, the best route to your destination is blue. Other routes are in gray on the map.</p> </div> <div data-bbox="386 363 1424 464" data-label="Text"> <p>Some directions in Google Maps are in beta, and may have limited availability. Always be cautious when using directions on Google Maps, remain aware of your surroundings at all times, and take necessary means to ensure safety of yourself and those around you. When in doubt, follow actual traffic regulations by confirming signage from the road or path that you are on when using directions.</p> </div> <div data-bbox="406 525 800 546" data-label="Text"> <p>Android Computer iPhone &amp; iPad</p> </div> <div data-bbox="393 611 893 930" data-label="List-Group"> <ol style="list-style-type: none"> <li>1. On your Android phone or tablet, open the Google M</li> <li>2. Search for your destination or tap it on the map.</li> <li>3. In the bottom left, tap Directions .</li> <li>4. Choose one of the following: <ul style="list-style-type: none"> <li>• Driving: </li> <li>• Motorcycle: </li> <li>• Transit: </li> <li>• Walking: </li> <li>• Rides: </li> <li>• Cycling: </li> </ul> </li> </ol> </div> <div data-bbox="917 558 1404 768" data-label="Text"> <p>The process of inputting a destination entry and initiating a navigation query at the Google Maps' client-side user interface (UI) at a user's communications device, and in response receiving navigation assistance (directions) from the remote Google Maps server.</p> </div> <div data-bbox="393 945 1341 1003" data-label="List-Group"> <ol style="list-style-type: none"> <li>5. To get the list of directions, tap the bar at the bottom that shows travel time and distance.</li> <li>6. To choose another route, tap it on the map. Each route shows the estimated travel time on the map.</li> </ol> </div> <div data-bbox="386 1018 430 1043" data-label="Text"> <p>Tip:</p> </div> <div data-bbox="386 1058 1424 1171" data-label="List-Group"> <ul style="list-style-type: none"> <li>• For transit directions, choose a route, then tap the bar at the bottom that shows travel time and distance.</li> <li>• Not all cities have public transit directions in Google Maps. <a href="#">Learn which cities are covered</a> .</li> <li>• For Driving  and Transit  directions, to pin your favorite trips, tap Pin  at the bottom. <a href="#">Learn more about how to pin your favorite trips</a>.</li> </ul> </div> <div data-bbox="367 1205 1424 1241" data-label="Text"> <p><b>Attachment 32 (Get directions and show routes - Android - Google Maps Help) at 1.</b></p> </div>

Claim 1	Corresponding Structure in Accused Systems
	<div data-bbox="435 233 609 262" style="border: 1px solid red; padding: 2px;">Save a route</div> <ol style="list-style-type: none"> <li>1. On your Android phone or tablet, open the Google Maps app .</li> <li>2. Make sure you're connected to the Internet.</li> <li>3. Search for your destination or tap it on the map.</li> <li>4. In the bottom left, tap Directions .</li> <li>5. From the top, choose your mode of transit.</li> <li>6. Tap the white bar at the bottom. It's the one that shows the travel time and distance.</li> <li>7. At the bottom, tap Save offline.</li> </ol> <p>Tip:</p> <ul style="list-style-type: none"> <li>• Your route is saved on your phone or tablet. Make sure to use the same phone or tablet when looking for a saved route.</li> <li>• Your saved route expires after 30 days.</li> <li>• Your route will show you the same mode of transit you chose when you saved the route.</li> </ul> <div data-bbox="435 730 673 760" style="border: 1px solid red; padding: 2px;">Find a saved route</div> <ol style="list-style-type: none"> <li>1. On your Android phone or tablet, open the Google Maps app .</li> <li>2. At the bottom, tap Saved offline route.</li> </ol> <p>Tip:</p> <ul style="list-style-type: none"> <li>• If you save a route from "Your location" and look up a saved route, the directions will start from the place where you saved the route. The directions won't start from your current location.</li> <li>• To get updated information like traffic, tap Refresh .</li> <li>• Turn-by-turn navigation isn't currently available for saved routes. To search for places and get turn-by-turn navigation, download an offline area.</li> </ul> <p><b>Attachment 32 (Get directions &amp; show routes) at 3.</b></p> <div data-bbox="407 1136 641 1165" style="border: 1px solid red; padding: 2px;">Update offline maps</div> <p>Offline maps that you downloaded on your phone or tablet need to be updated before they expire. When your offline maps expire in 15 days or less, Google Maps will try to update the area automatically when you're connected to Wi-Fi.</p> <p>If your offline maps aren't automatically updated, you can update them by following the steps below.</p> <p><b>From the notification</b></p> <ol style="list-style-type: none"> <li>1. In the "Update offline maps" notification, tap Update Now.</li> <li>2. Tap the expired or expiring area on the list.</li> <li>3. Tap Update.</li> <li>4. The offline area will update</li> </ol> <p><b>From anywhere else</b></p> <ol style="list-style-type: none"> <li>1. On your Android phone or tablet, open the Google Maps app .</li> <li>2. Tap your profile picture or initial  &gt; Offline maps.</li> <li>3. Tap the expired or expiring area on the list.</li> <li>4. Tap Update.</li> <li>5. The offline area will update</li> </ol> <p><b>Attachment 31 (Download google map) at 3.</b></p>

Claim 1	Corresponding Structure in Accused Systems
	<div data-bbox="410 323 992 359"> <h2>Get traffic or search for places along the way</h2> </div> <div data-bbox="410 367 870 384"> <p><b>Important:</b> This feature is only available on Android devices and in some countries.</p> </div> <div data-bbox="410 394 1018 430"> <p>With Google Maps, you can get traffic for your drive, search for places easily, or quickly navigate to a common type of place, even if you don't enter a destination in Maps.</p> </div> <div data-bbox="410 462 647 487"> <h3>Get traffic for your drive</h3> </div> <div data-bbox="410 497 571 514"> <p>To view traffic for your drive:</p> </div> <div data-bbox="410 525 795 590"> <ol style="list-style-type: none"> <li>1. On your mobile device, open the Google Maps app.</li> <li>2. At the bottom, tap Go.</li> <li>3. Select one of the trip options that show up from your past activity.</li> </ol> </div> <div data-bbox="410 598 847 617"> <p><b>Tip:</b> If the selected trip doesn't show up, scroll to find and pin the trip you want.</p> </div> <div data-bbox="410 627 560 646"> <p>You'll find information like:</p> </div> <div data-bbox="410 655 1011 739"> <ul style="list-style-type: none"> <li>• How long it takes to drive to a suggested destination. Destinations are shown based on <a href="#">data from Google Account settings</a>.</li> <li>• Recommended and alternate routes.</li> <li>• Traffic delays along the way, such as crashes or construction work.</li> </ul> </div> <div data-bbox="410 747 571 764"> <p><a href="#">Learn how to use the Go tab.</a></p> </div> <div data-bbox="410 791 623 814"> <h3>Create a driving shortcut</h3> </div> <div data-bbox="410 823 865 842"> <p>To easily get traffic for your drive, create a driving shortcut for your mobile screen.</p> </div> <div data-bbox="410 850 794 915"> <ol style="list-style-type: none"> <li>1. On your mobile device, open the Google Maps app.</li> <li>2. Tap your profile picture or initial.</li> <li>3. Choose <b>Settings</b> &gt; <b>Navigation settings</b> &gt; <b>Add Driving shortcut</b>.</li> </ol> </div> <div data-bbox="410 938 742 963"> <h3>Get driving notifications with Bluetooth</h3> </div> <div data-bbox="410 970 1037 1008"> <p>If you have Bluetooth turned on and your phone or tablet is paired to your car, you'll get driving notifications when you start your car. To turn on notifications:</p> </div> <div data-bbox="410 1016 790 1081"> <ol style="list-style-type: none"> <li>1. On your mobile device, open the Google Maps app.</li> <li>2. Tap your profile picture or initial.</li> <li>3. Choose <b>Settings</b> &gt; <b>Navigation settings</b> &gt; <b>Driving notifications</b>.</li> </ol> </div> <div data-bbox="410 1113 660 1138"> <h3>Find events on your route</h3> </div> <div data-bbox="410 1148 865 1167"> <p>When you check the traffic on your route, you may find events highlighted, such as:</p> </div> <div data-bbox="410 1176 514 1262"> <ul style="list-style-type: none"> <li>• Concerts</li> <li>• Parades</li> <li>• Marathons</li> <li>• Sporting events</li> </ul> </div> <div data-bbox="410 1270 693 1289"> <p>On event days, you'll get updates about things like:</p> </div> <div data-bbox="410 1299 526 1386"> <ul style="list-style-type: none"> <li>• Delays</li> <li>• Closures</li> <li>• Traffic conditions</li> <li>• Alternate routes</li> </ul> </div> <div data-bbox="410 1394 989 1413"> <p>This info will go away automatically once the event is over. Explore other activities you can find in Maps.</p> </div> <div data-bbox="1133 386 1175 403"> <p>Help</p> </div> <div data-bbox="1133 428 1401 1054"> <ul style="list-style-type: none"> <li>Get directions &amp; show routes</li> <li>Use navigation in the Google Maps app</li> <li>Check your speed</li> <li>Request a ride</li> <li>Add a shortcut to places you visit often</li> <li>Get traffic or search for places along the way</li> <li>Use Google Assistant while navigating</li> <li>Get train &amp; bus departures</li> <li>Get directions without unlocking your phone</li> <li>Set a reminder to leave for your trip</li> <li>Plan your commute or trip</li> <li>Use Live View on Google Maps</li> <li>Know when you're taken off suggested route</li> <li>Use CarPlay to find stops on your route</li> <li>Use Google Maps on your Apple Watch</li> <li>How to use the Go tab</li> </ul> </div>

**Attachment 26 (Get traffic or search for places along the way - Google Maps Help) at 1.**



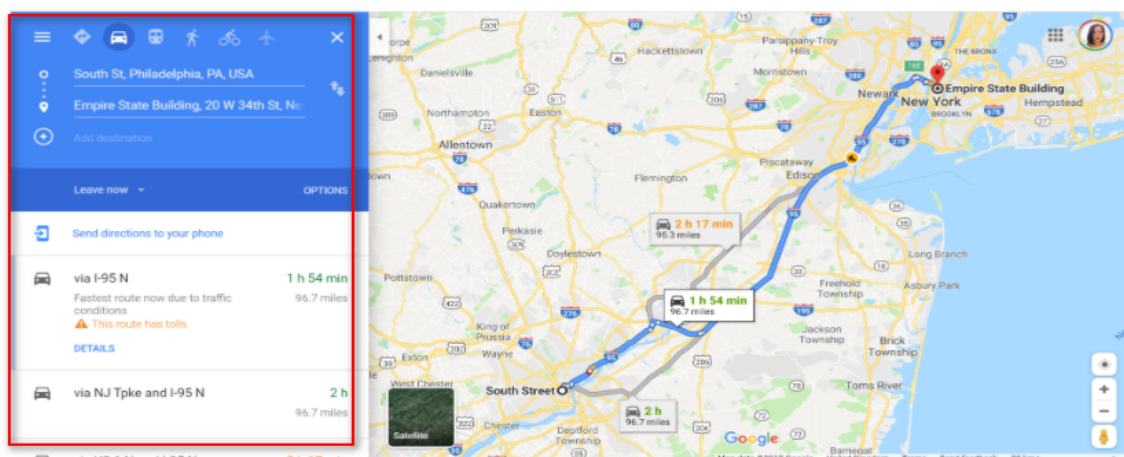
Claim 1	Corresponding Structure in Accused Systems
	<p><b>Putting it all together</b></p> <p>So how exactly does this all work in real life? Say you're heading to a doctor's appointment across town, driving down the road you typically take to get there. When you leave the house, traffic is flowing freely, with zero indication of any disruptions along the way. With Google Maps' traffic predictions combined with live traffic conditions, we let you know that if you continue down your current route, there's a good chance you'll get stuck in unexpected gridlock traffic about 30 minutes into your ride—which would mean missing your appointment. As a result, Google Maps automatically reroutes you using its knowledge about nearby road conditions and incidents—helping you avoid the jam altogether and get to your appointment on time.</p> <p>Predicting traffic and determining routes is incredibly complex—and we'll keep working on tools and technology to keep you out of gridlock, and on a route that's as safe and efficient as possible. ■</p> <p><b>Attachment 35 (How AI helps predict traffic and determine routes - Google Maps) at 2.</b></p>

## Claim 1

## Corresponding Structure in Accused Systems

**How to change your route on Google Maps on desktop**

1. Open Google Maps and type in the address or name of the location you wish to travel to before pressing Enter.
2. Once the location comes up, click the Directions button beneath the info card. 3. Enter the starting point for your journey. This could be your home address or wherever you'll be departing from.
4. Using the menu box above the journey information, choose which directions you would like to use - options for the purposes of this article include driving, public transit, cycling, and walking.
5. On the map, you'll notice outlines for several routes. The default one, or the one Google Maps believes is best, will be highlighted blue.



Jennifer Still/Business Insider

You can change your route by choosing one of the grey alternate ones, or dragging it to another route.

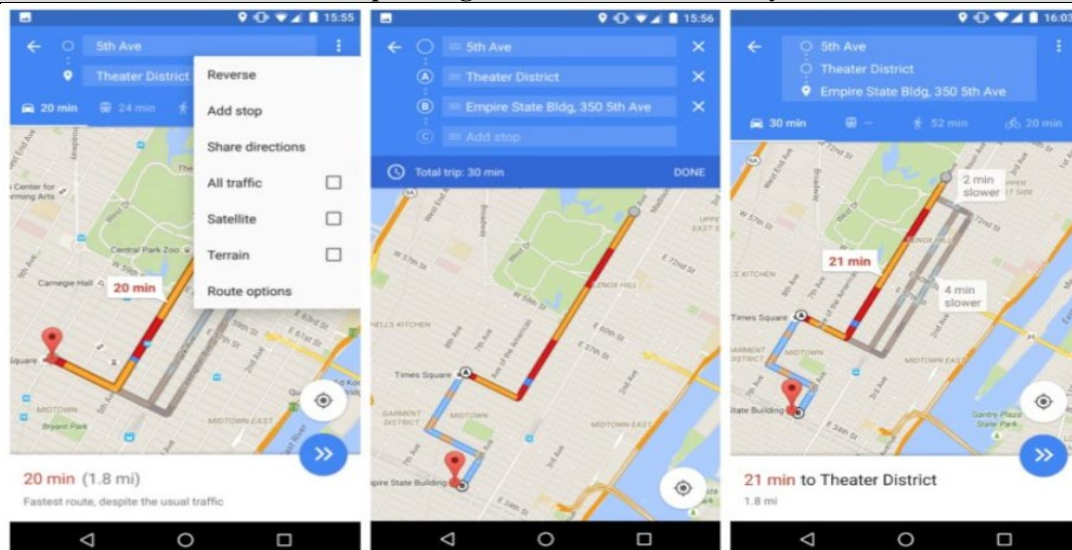
6. To choose an alternate route, either click on a greyed-out route on the map or click on one of the other routes listed on the left-hand side menu. Note that you can also change routes by clicking on one and dragging it so that the directions will take you via certain roads.

**Attachment 37 (How to change the route on Google Map) at 3.**


Google map Navigator hardware/software (Exhibit C) in the wireless network computes the estimated time delays (numerical value) for each segment corresponding to the time to travel through each segment. The updated information in response to user's current navigation information is then transmitted by the Google Map hardware/software (Exhibit C) to the wireless communication device (Exhibit-B)

## Claim 1

## Corresponding Structure in Accused Systems



Attachment 24 (Traffic information summary on Google Maps) at 9.



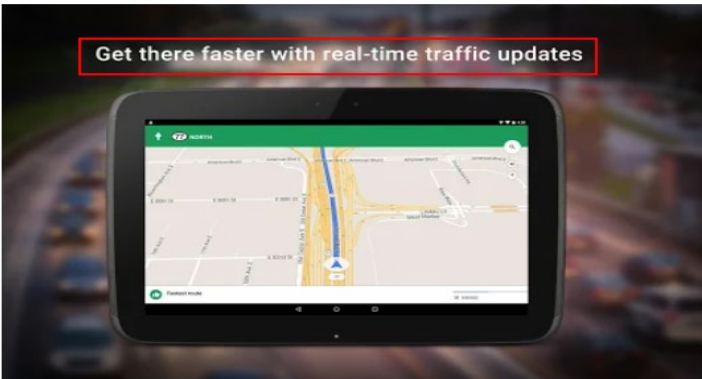

**Google Maps** - Navigate & Explore Editors' Choice

Google LLC Travel & Local ★★★★★ 1,27,56,420

Everyone

Contains ads

Add to wishlist Install











Navigate your world faster and easier with Google Maps. Over 220 countries and territories mapped and hundreds of millions of businesses and places on the map. Get real-time GPS navigation, traffic, and transit info, and explore local neighborhoods by knowing where to eat, drink and go - no matter what part of the world you're in.

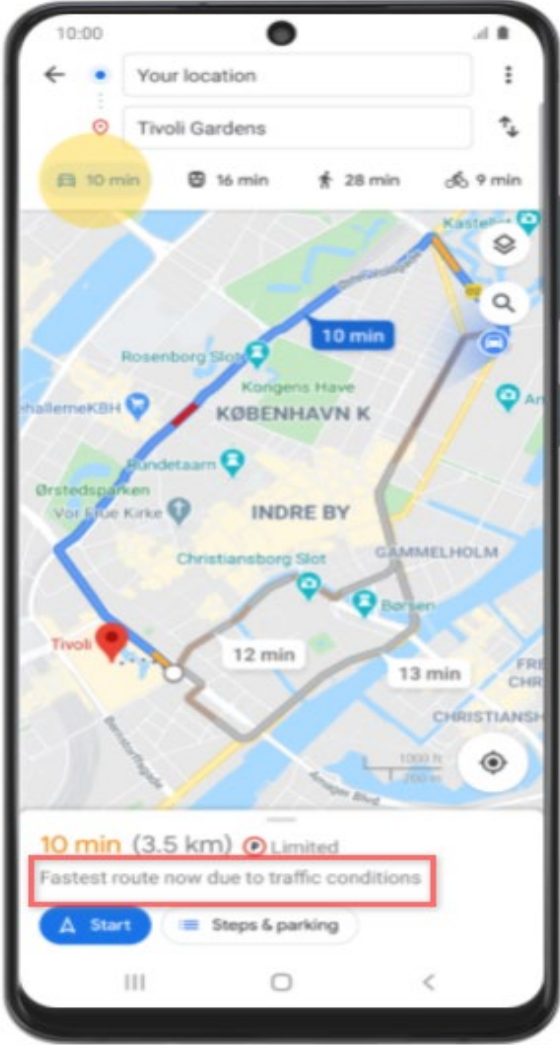
Get there faster with real-time updates

- Beat traffic with real-time ETAs and traffic conditions
- Catch your bus, train, or ride-share with real-time transit info
- Save time with automatic rerouting based on live traffic, incidents, and road closures

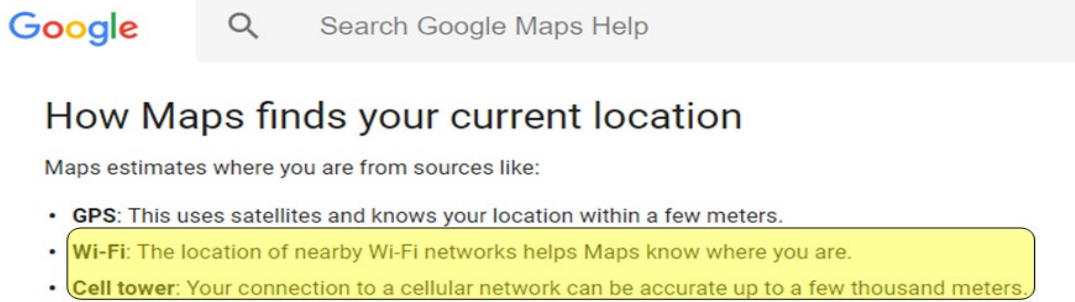
Attachment 23 (Google Maps – Navigation &amp; Explore) at 1.

Claim 1	Corresponding Structure in Accused Systems
	<div data-bbox="407 233 846 279" style="border: 1px solid red; padding: 2px;">Find live traffic for buses</div> <ol style="list-style-type: none"> <li>1. On your Android phone or tablet, open the Google Maps app .</li> <li>2. Search for your destination, then select transit directions. <a href="#">Read more about how to get directions.</a></li> <li>3. If a bus route has Live Traffic for Buses information available, one of the following will be displayed: <ul style="list-style-type: none"> <li>• Usual traffic</li> <li>• How many minutes are added for traffic</li> </ul> </li> </ol> <p>What the colors and symbols mean on the legend</p> <hr/> <p>Nearby places of interest </p> <hr/> <p>Traffic </p> <div> <p><b>Traffic colors</b></p> <p>The color code shows you the speed of traffic on the road.</p> <ul style="list-style-type: none"> <li>• <span style="border: 1px solid red; padding: 2px;">Green: No traffic delays.</span></li> <li>• Orange: Medium amount of traffic.</li> <li>• Red: Traffic delays. The darker the red, the slower the speed of traffic on the road.</li> </ul> <p>Note: Gray or blue lines on the map show your routes.</p> <p><b>Traffic incident symbols</b></p> <p>Traffic incidents include these types of delays:</p> <ul style="list-style-type: none"> <li>• Crashes </li> <li>• Construction </li> <li>• Road closures </li> <li>• Other incidents </li> </ul> <p>To find details about what happened, click or tap the icon.</p> <p>Note: For road closures, you'll find a dotted red line where the road is closed.</p> </div> <p><b>Attachment 34 (View places, traffic, terrain, biking, and transit) at 2.</b></p>

Claim 1	Corresponding Structure in Accused Systems
	<div data-bbox="386 237 1156 338"> <h3>Plan your commute or trip</h3> <p>Before you start your drive or transit trip to home, work or other places, plan your trip and find useful info. This way, you can know when to leave, what traffic to expect, which route to take, and if there are any disruptions along the way.</p> </div> <div data-bbox="386 373 1143 407"> <p><a href="#">Android</a>   <a href="#">Computer</a>   <a href="#">iPhone &amp; iPad</a></p> </div> <div data-bbox="386 436 1130 562"> <h3>Find traffic &amp; transit info</h3> <p>You can use Google Maps to quickly find all of your frequent trips in one tap. You'll get information about your ETA, the traffic reports and the accidents along the way.</p> <ol style="list-style-type: none"> <li>1. On your Android phone or tablet, open the Google Maps app .</li> <li>2. At the bottom, tap Go .</li> </ol> <p>Tip: To show the map, tap anywhere on the map or drag the tabs back down.</p> </div> <div data-bbox="386 619 980 892"> <h3>Change the way you commute</h3> <p>You can get access to directions for your frequent trips by pinning trips on the Go tab .</p> <ol style="list-style-type: none"> <li>1. On your Android phone or tablet, open the Google Maps app .</li> <li>2. At the bottom, tap Go .</li> <li>3. Search for your destination in the search bar at the top.</li> <li>4. At the bottom, tap on "Directions."</li> <li>5. At the top, select your transportation mode.</li> <li>6. Select your preferred route.</li> <li>7. At the bottom, tap Pin .</li> </ol> <p>You can pin your trip and find it back in the Go tab next time you need it.</p> <p>Tip: Pinning only works with "Driving" and "Transit." <a href="#">Learn more about the Go tab</a> .</p> </div> <div data-bbox="386 905 1159 1157"> <h3>Check traffic now &amp; later</h3> <p>To reach your destination as quickly as possible, check typical traffic before you drive. You can avoid the busiest times of day.</p> <ol style="list-style-type: none"> <li>1. On your Android phone or tablet, open the Google Maps app .</li> <li>2. Search for a destination, or tap a place on the map.</li> <li>3. At the bottom, tap <b>Directions</b>.</li> <li>4. At the top, tap Driving .</li> <li>5. At the bottom, tap the white bar to display: <ul style="list-style-type: none"> <li>• The current traffic on your route</li> <li>• Typical traffic by the hour and any slowdowns on the way</li> </ul> </li> </ol> </div> <div data-bbox="386 1163 1169 1331"> <h3>Change the mode of transportation for part of your trip</h3> <p>Tip: Only available on mobile and in some locations.</p> <p>You can combine different modes of transportation, like driving, ride-sharing, or bicycling with transit on the same trip.</p> <p>Once you've selected your route and can view the directions, you may be able to change how you travel for part of your trip. The rest of the route, like transit departure times and total journey time, will be updated when you change the mode of transportation.</p> </div> <p><b>Attachment 36 (Plan your commute or trip) at 1&amp;2.</b></p>

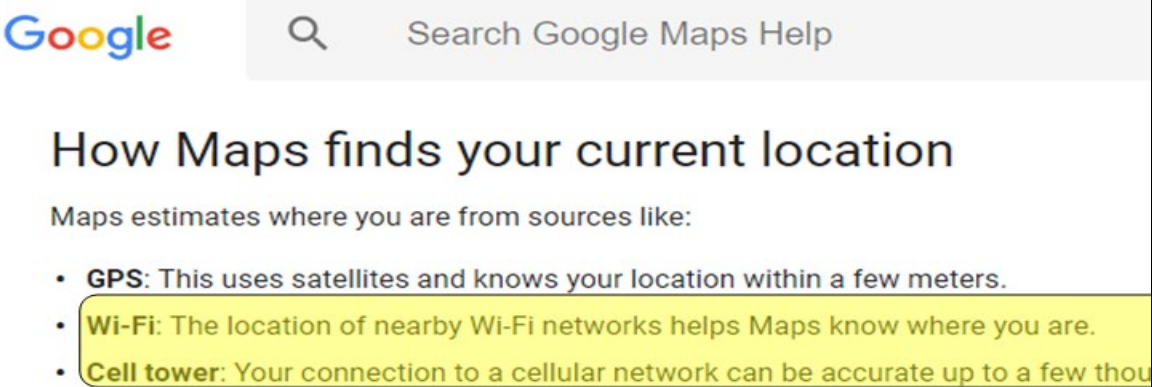
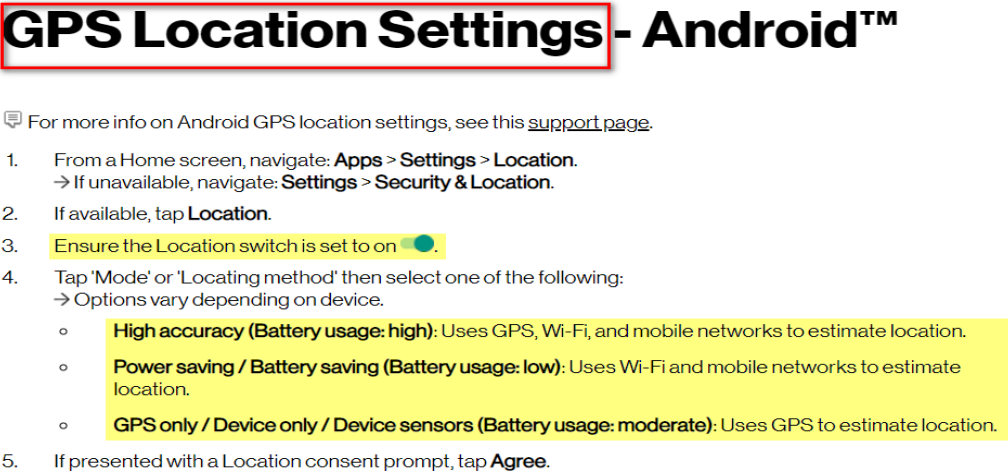
Claim 1	Corresponding Structure in Accused Systems
	 <p>Navigation Information displayed to user by the processor on the wireless communication device (Exhibit-B) based on destination entered by the user.</p> <p><b>Attachment 25 (Use Google Maps - Samsung Galaxy S20 Ultra 5G) at 6.</b></p>
<p>at least one second radio-frequency transceiver and an associated at least one second antenna of the wireless communications network to which the second radio-frequency transceiver is coupled; and</p>	<p>Plaintiff contends each Accused System includes at least one item listed on Exhibit A, each of which is a base station and each of which is coupled to at least one antenna. Base station includes radio-frequency transceivers designed and used for radio-frequency communication with at least one antenna. When base-station transceivers and antennas are in communication, they are coupled. Further, in addition to being so coupled, the transceivers and antenna of each Exhibit-A item are also, by placement within a base station, physically coupled.</p> <p>The cell of the wireless communications network include base stations for transmission and reception of wireless signals to and from the mobile wireless communication devices or UEs or user devices (mobile phones, laptops, tablets, PDAs etc.). These base stations are, therefore, RF transceivers. Also, these base stations are coupled with at least one antenna for the function of transmission and reception.</p> <p>The following exemplifies this limitation's existence in Accused Systems:</p>






Claim 1	Corresponding Structure in Accused Systems
	 <p><b>How Maps finds your current location</b></p> <p>Maps estimates where you are from sources like:</p> <ul style="list-style-type: none"> <li>• <b>GPS:</b> This uses satellites and knows your location within a few meters.</li> <li>• <b>Wi-Fi:</b> The location of nearby Wi-Fi networks helps Maps know where you are.</li> <li>• <b>Cell tower:</b> Your connection to a cellular network can be accurate up to a few thousand meters.</li> </ul> <p><b>Attachment 8 (How map find your current location) at 2.</b></p> <p>Knowing where the user is allows your application to be smarter and deliver better information to the user. When developing a location-aware application for Android, you can utilize GPS and Android's Network Location Provider to acquire the user location. Although GPS is most accurate, it only works outdoors, it quickly consumes battery power, and doesn't return the location as quickly as users want. <b>Android's Network Location Provider determines user location using cell tower and Wi-Fi signals,</b> providing location information in a way that works indoors and outdoors, responds faster, and uses less battery power. To obtain the user location in your application, you can use both GPS and the Network Location Provider, or just one.</p> <p><b>Attachment 12 (Location of the device determined using cell tower) at 1&amp;2.</b></p> <div data-bbox="646 1031 1258 1213" style="border: 1px solid black; border-radius: 10px; padding: 10px; margin: 10px auto; width: fit-content;"> <p>Google Maps provides location information based on cell towers/Wi-Fi nodes which form part of cellular communication network. These cell towers are radio frequency transceivers with antenna (Exhibit A).</p> </div> <p><b>Introduction</b></p> <p><b>The Geolocation API returns a location and accuracy radius based on information about cell towers and WiFi nodes</b> that the mobile client can detect. This document describes the protocol used to send this data to the server and to return a response to the client.</p> <p>Communication is done over HTTPS using POST. Both request and response are formatted as JSON, and the content type of both is <code>application/json</code>.</p> <p><b>Attachment 17 (Cell Towers/Wi-Fi Nodes (RF transceivers) in a wireless communication network) at 1</b></p>

Claim 1	Corresponding Structure in Accused Systems
	<p>The first parameter in <code>requestLocationUpdates()</code> is the <code>type of location provider to use (in this case, the Network Location Provider for cell tower and Wi-Fi based location)</code>. You can control the frequency at which your listener receives updates with the second and third parameter—the second is the minimum time interval between notifications and the third is the minimum change in distance between notifications—setting both to zero requests location notifications as frequently as possible. The last parameter is your <code>LocationListener</code>, which receives callbacks for location updates.</p> <p>To request location updates from the GPS provider, use <code>GPS_PROVIDER</code> instead of <code>NETWORK_PROVIDER</code>. You can also request location updates from both the GPS and the Network Location Provider by calling <code>requestLocationUpdates()</code> twice—once for <code>NETWORK_PROVIDER</code> and once for <code>GPS_PROVIDER</code>.</p> <p><b>Requesting User Permission</b></p> <p>In order to receive location updates from <code>NETWORK_PROVIDER</code> or <code>GPS_PROVIDER</code>, your application must request the user's permission by declaring either the <code>ACCESS_COARSE_LOCATION</code> or <code>ACCESS_FINE_LOCATION</code> permission, respectively, in your Android manifest file. Without these permissions, your application will fail at runtime when requesting location updates.</p> <p>If you are using both <code>NETWORK_PROVIDER</code> and <code>GPS_PROVIDER</code>, then you need to request only the <code>ACCESS_FINE_LOCATION</code> permission, because it includes permission for both providers. Permission for <code>ACCESS_COARSE_LOCATION</code> allows access only to <code>NETWORK_PROVIDER</code>.</p> <p><b>Attachment 12 (Location is estimated using cell tower/wi-fi network) at 3 &amp; 4.</b></p> <p>Help your phone get a more accurate location (Google Location Services a.k.a. Google Location Accuracy)</p> <p><b>Turn your phone's location accuracy on or off</b></p> <ol style="list-style-type: none"> <li>1. Open your device's Settings app.</li> <li>2. Tap Location &gt; Advanced &gt; Google Location Accuracy.</li> <li>3. Turn Improve Location Accuracy on or off.</li> </ol> <hr/> <p><b>When Google Location Accuracy is on</b> ^</p> <p>When you have Google Location Accuracy turned on, your phone uses these sources to get the most accurate location:</p> <ul style="list-style-type: none"> <li>• GPS</li> <li>• <b>Wi-Fi</b></li> <li>• <b>Mobile networks</b></li> <li>• Sensors</li> </ul> <p>Wireless communication device receive the location of the Wireless communication device (Exhibit B) on Google Map from Wireless communication networks (e.g. Verizon, AT&amp;T, T-Mobile, etc.)</p> <hr/> <p><b>When Google Location Accuracy is off</b> v</p> <p><b>Let your phone scan for nearby networks or devices</b></p> <p>To help apps get better location info, you can let your phone scan for nearby Wi-Fi access points or Bluetooth devices.</p> <ol style="list-style-type: none"> <li>1. Open your device's Settings app.</li> <li>2. <b>Tap Location &gt; Wi-Fi and Bluetooth scanning.</b></li> <li>3. Turn Wi-Fi scanning or Bluetooth scanning on or off.</li> </ol>

Claim 1	Corresponding Structure in Accused Systems
	<p><b>Attachment 21 (Manage your Pixel phone's location settings) at 2.</b></p> <ol style="list-style-type: none"> <li>1. On your Android device, go to <b>Settings</b></li> <li>2. Tap <b>Location</b> and re-enable your location services</li> <li>3. Select <b>Mode High accuracy</b></li> </ol> <div data-bbox="613 464 1211 835"> <p>The user of the wireless device can select the method of the location estimation</p> </div> <p>On some phone models, this option can be found under the Advanced Settings option.</p> <p>Select <b>Advanced Settings</b> and enable your device to improve positioning accuracy by allowing apps to scan for Wi-Fi networks and Bluetooth devices at any time, even if Wi-Fi or Bluetooth is disabled.</p> <div data-bbox="613 1029 1211 1409"> </div> <p><b>Attachment 33 (Google Maps Not Updating Location) at 4.</b></p>

Claim 1	Corresponding Structure in Accused Systems
<p>a second processor coupled to the at least one second radio-frequency transceiver programmed to acquire the information indicative of a location of the wireless mobile communications device,</p>	<p>Plaintiff contends that Google Maps has one or more processors that determine(s) the location of wireless mobile communications devices. These processors communicatively coupled to the second RF transceiver(s) and are programmed to determine a wireless mobile communication device's location.</p> <p>Wireless mobile communications devices can, through the second RF transceiver(s), communicatively connect to and use Google Maps. Google Maps' processors can determine the device's current location and direction from that location/source to any destination. The processors are programmed to estimate the location of the device from 3 sources: GPS (GPS uses satellites and knows your location within a few meters), Wi-Fi (the location of nearby Wi-Fi networks helps Maps know where you are), and cell towers (cell tower can be accurate up to a few thousand meters).</p> <p>The following exemplifies this limitation's existence in Accused Systems:</p>  <p><b>Attachment 8 (How map find your current location) at 2.</b></p>  <p><b>Attachment 18 (method of estimate the location of the device) at 1.</b></p>

Claim 1	Corresponding Structure in Accused Systems
	<div data-bbox="396 260 506 296">Settings</div> <div data-bbox="740 254 1159 342"> <p>Google map estimates the location of the device from 3 sources: GPS, Wi-Fi and cell towers</p> </div> <div data-bbox="396 350 553 386"> <p><b>Location</b></p> </div> <div data-bbox="396 405 1321 470"> <p>Location services use a combination of GPS, mobile network and Wi-Fi to determine the location of your device.</p> </div> <div data-bbox="420 491 865 567"> <ol style="list-style-type: none"> <li>1. From Settings, tap  <b>Location</b>.</li> <li>2. Tap  to turn on Location services.</li> </ol> </div> <div data-bbox="396 583 1274 623"> <p> <b>TIP</b> Some apps require location services be turned on for full functionality.</p> </div> <p><b>Attachment 15 (Turn ON/OFF the location setting) at 161.</b></p> <p>Knowing where the user is allows your application to be smarter and deliver better information to the user. When developing a location-aware application for Android, you can utilize GPS and Android's Network Location Provider to acquire the user location. Although GPS is most accurate, it only works outdoors, it quickly consumes battery power, and doesn't return the location as quickly as users want.</p> <p>Android's Network Location Provider determines user location using cell tower and Wi-Fi signals, providing location information in a way that works indoors and outdoors, responds faster, and uses less battery power. To obtain the user location in your application, you can use both GPS and the Network Location Provider, or just one.</p> <p><b>Attachment 12 (Location of the device determine using cell tower) at 1&amp;2.</b></p> <div data-bbox="714 1165 1268 1312"> <p>Google Maps provides location information based on cell towers/Wi-Fi nodes which form part of cellular communication network. These cell towers are radio frequency transceivers with antenna (Exhibit A).</p> </div> <p><b>Introduction</b></p> <p>The Geolocation API returns a location and accuracy radius based on information about cell towers and WiFi nodes that the mobile client can detect. This document describes the protocol used to send this data to the server and to return a response to the client.</p> <p>Communication is done over HTTPS using POST. Both request and response are formatted as JSON, and the content type of both is <code>application/json</code>.</p> <p><b>Attachment 17 (Cell Towers/Wi-Fi Nodes (RF transceivers) in a wireless communication network) at 1.</b></p>






Claim 1	Corresponding Structure in Accused Systems
	<p>The first parameter in <code>requestLocationUpdates()</code> is the <code>type of location provider to use (in this case, the Network Location Provider for cell tower and Wi-Fi based location)</code>. You can control the frequency at which your listener receives updates with the second and third parameter—the second is the minimum time interval between notifications and the third is the minimum change in distance between notifications—setting both to zero requests location notifications as frequently as possible. The last parameter is your <code>LocationListener</code>, which receives callbacks for location updates.</p> <p>To request location updates from the GPS provider, use <code>GPS_PROVIDER</code> instead of <code>NETWORK_PROVIDER</code>. You can also request location updates from both the GPS and the Network Location Provider by calling <code>requestLocationUpdates()</code> twice—once for <code>NETWORK_PROVIDER</code> and once for <code>GPS_PROVIDER</code>.</p> <p><b>Requesting User Permissions</b></p> <p>In order to receive location updates from <code>NETWORK_PROVIDER</code>, your application must request the <code>ACCESS_COARSE_LOCATION</code> or <code>ACCESS_FINE_LOCATION</code> permission, respectively, in your Android manifest file. Without these permissions, your application will fail at runtime when requesting location updates.</p> <p>If you are using both <code>NETWORK_PROVIDER</code> and <code>GPS_PROVIDER</code>, then you need to request only the <code>ACCESS_FINE_LOCATION</code> permission, because it includes permission for both providers. Permission for <code>ACCESS_COARSE_LOCATION</code> allows access only to <code>NETWORK_PROVIDER</code>.</p> <p><b>Attachment 12 (Location is estimated using cell tower/wi-fi network) at 3 &amp; 4.</b></p> <p>Help your phone get a more accurate location (Google Location Services a.k.a. Google Location Accuracy)</p> <p><b>Turn your phone's location accuracy on or off</b></p> <ol style="list-style-type: none"> <li>1. Open your device's Settings app.</li> <li>2. Tap <b>Location</b> &gt; <b>Advanced</b> &gt; <b>Google Location Accuracy</b>.</li> <li>3. Turn <b>Improve Location Accuracy</b> on or off.</li> </ol> <hr/> <p><b>When Google Location Accuracy is on</b> ^</p> <p>When you have Google Location Accuracy turned on, your phone uses these sources to get the most accurate location:</p> <ul style="list-style-type: none"> <li>• GPS</li> <li>• <b>Wi-Fi</b></li> <li>• <b>Mobile networks</b></li> <li>• Sensors</li> </ul> <p>Wireless communication device receive the location of the Wireless communication device (Exhibit B) on Google Map from Wireless communication networks (e.g. Verizon, AT&amp;T, T-Mobile, etc.)</p> <hr/> <p><b>When Google Location Accuracy is off</b> v</p> <hr/> <p><b>Let your phone scan for nearby networks or devices</b></p> <p>To help apps get better location info, you can let your phone scan for nearby Wi-Fi access points or Bluetooth devices.</p> <ol style="list-style-type: none"> <li>1. Open your device's Settings app.</li> <li>2. Tap <b>Location</b> &gt; <b>Wi-Fi and Bluetooth scanning</b>.</li> <li>3. Turn <b>Wi-Fi scanning</b> or <b>Bluetooth scanning</b> on or off.</li> </ol> <p><b>Attachment 21 (Manage your Pixel phone's location settings) at 2.</b></p>



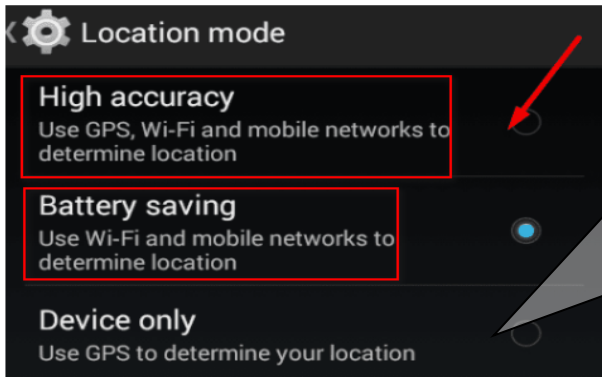
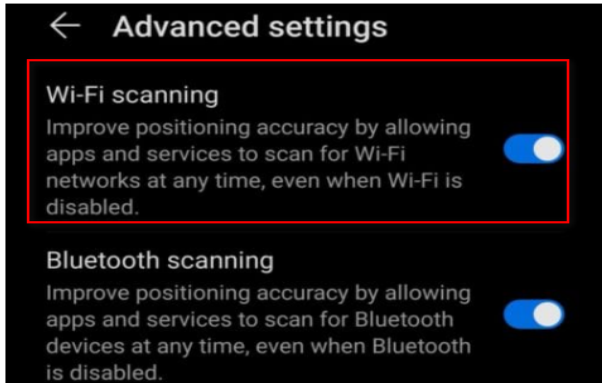
Claim 1	Corresponding Structure in Accused Systems
	<ol style="list-style-type: none"> <li>1. On your Android device, go to <b>Settings</b></li> <li>2. Tap <b>Location</b> and re-enable your location services</li> <li>3. Select <b>Mode High accuracy</b></li> </ol> <div data-bbox="613 415 1214 787"> </div> <div data-bbox="1222 409 1469 793"> <p>The user of the wireless device can select the method of the location estimation</p> </div> <p>On some phone models, this option can be found under the Advanced Settings option.</p> <p>Select <b>Advanced Settings</b> and enable your device to improve positioning accuracy by allowing apps to scan for Wi-Fi networks and Bluetooth devices at any time, even if Wi-Fi or Bluetooth is disabled.</p> <div data-bbox="613 980 1214 1360"> </div> <p><b>Attachment 33 (Google Maps Not Updating Location) at 4.</b></p>

Claim 1	Corresponding Structure in Accused Systems
	<div data-bbox="373 220 945 1234"> </div> <div data-bbox="1052 283 1477 1234"> <p>By default the “Location setting” is set at “High accuracy” mode, wherein, for example, accuracy of location of a communications device determined based on locations of nearby Wi-Fi network infrastructure (access points or hotspots) is further enhanced or fine-tuned by Google Maps Server additionally using the said communications device’s GPS location and the location data obtained from the mobile network (Cell tower information and/or Location of the communications device determined through the Assisted-GPS method by the said mobile network) serving the said communications device.</p> </div> <p data-bbox="373 1270 1214 1302"><b>Attachment 45 (Google Maps_Android app_Location settings) at 1.</b></p>

Claim 1	Corresponding Structure in Accused Systems
	<h2 data-bbox="391 258 1328 310">Find and improve your location's accuracy</h2> <p data-bbox="391 331 1458 426">Sometimes Google Maps might have trouble finding where you are located. If the GPS location of your blue dot on the map is inaccurate or the blue dot is not showing up, here are some things you can do to help fix the problem.</p> <p data-bbox="391 453 1195 478">Tip: This will also improve your search results and make them more relevant to you.</p> <div data-bbox="410 558 820 583"> <p>Computer   <b>Android</b>   iPhone &amp; iPad</p> </div> <hr data-bbox="391 615 1484 619"/> <h3 data-bbox="391 678 1016 720">See your current location on the map</h3> <ol data-bbox="391 741 1446 863" style="list-style-type: none"> <li>1. On your Android phone or tablet, open the Google Maps app .</li> <li>2. You'll see a blue dot, which shows where you are. If you don't see a blue dot, go to the bottom and tap Your location .</li> </ol> <h3 data-bbox="391 919 1016 961">How Maps finds your current location</h3> <p data-bbox="391 982 865 1008">Maps estimates where you are from sources like:</p> <ul data-bbox="391 1035 1471 1178" style="list-style-type: none"> <li>• <b>GPS:</b> This uses satellites and knows your location up to around 20 meters. <b>Note:</b> When you're inside buildings or underground, the GPS is sometimes inaccurate.</li> <li>• <b>Wi-Fi:</b> The location of nearby Wi-Fi networks helps Maps know where you are.</li> <li>• <b>Cell tower:</b> Your connection to a cellular network can be accurate up to a few thousand meters.</li> </ul> <p data-bbox="375 1188 1511 1251"><b>Attachment 46 (Find and improve your location's accuracy - Android - Google Maps Help) at 1.</b></p>

Claim 1	Corresponding Structure in Accused Systems
	<p data-bbox="386 247 621 279"><b>From your devices</b></p> <p data-bbox="386 304 1485 447">Many devices, like phones or computers, can work out their precise location. You can allow Google and other apps to provide you with useful features based on where your device is located. For example, if you're running late to meet your friends, you'll probably want to use a navigation app to know the quickest way to get to your destination. To get turn-by-turn directions, you may need to turn on your device's location and give the app the permission to access it. Or for some searches like "coffee shop", "bus stop" or "atm", results will usually be more helpful when precise location is available.</p> <p data-bbox="386 487 1469 609">On your Android device, if you choose to <a href="#">turn on</a> your device location, you can use features like navigation, giving an app access to your current location, or find your phone. You can also choose which apps have permission to use your device's location with simple controls that let you turn the permission on or off for individual apps. On Android, you can see when an app is requesting to use your phone's GPS-based location when the top of your screen shows Location  <a href="#">Learn more</a></p> <p data-bbox="443 632 686 663"><b>Google Location Services</b></p> <p data-bbox="443 695 1421 898">On most Android devices, Google, as the network location provider, provides a location service called Google Location Services (GLS), known in Android 9 and above as Google Location Accuracy. This service aims to provide a more accurate device location and generally improve location accuracy. Most mobile phones are equipped with GPS, which uses signals from satellites to determine a device's location – however, with Google Location Services, additional information from nearby Wi-Fi, mobile networks, and device sensors can be collected to determine your device's location. It does this by periodically collecting location data from your device and using it in an anonymous way to improve location accuracy.</p> <p data-bbox="443 938 1421 1050">You can disable Google Location Services at any time in your device's location settings. Your device's location will continue to work even if GLS is turned off, but the device will rely only on GPS to estimate device location for apps with the necessary permission. Google Location Services is distinct from your device's location setting. <a href="#">Learn more</a></p> <p data-bbox="386 1096 1464 1182">The settings and permissions on Android control whether your device sensors (like GPS) or network-based location (like GLS) are used to determine your location and which apps have access to that location. They do not impact how websites and apps might estimate your location in other ways, such as from your IP Address.</p> <p data-bbox="373 1203 1477 1270"><b>Attachment 44 (How Google uses location information – Privacy &amp; Terms – Google) at 2 &amp; 3.</b></p>

Claim 1	Corresponding Structure in Accused Systems
	<p data-bbox="440 239 930 268">If you use an older Android version</p> <p data-bbox="459 296 821 317">Choose location settings (Android 9.0) ^</p> <p data-bbox="483 342 716 359">To change location settings:</p> <ol data-bbox="488 373 860 441" style="list-style-type: none"> <li>1. Open your device's Settings app.</li> <li>2. Tap <b>Security &amp; Location</b> &gt; <b>Location</b>. <ul style="list-style-type: none"> <li>• If you have a work profile, tap <b>Advanced</b>.</li> </ul> </li> </ol> <p data-bbox="483 453 680 470">Then, choose an option:</p> <ul data-bbox="488 483 1328 590" style="list-style-type: none"> <li>• <b>Turn Location on or off:</b> Tap <b>Location</b>.</li> <li>• <b>Scan for nearby networks:</b> Tap <b>Advanced</b> &gt; <b>Scanning</b>. Turn <b>Wi-Fi scanning</b> or <b>Bluetooth scanning</b> on or off.</li> <li>• <b>Turn emergency location service on or off:</b> Tap <b>Advanced</b> &gt; <b>Google Emergency Location Service</b>. Turn <b>Emergency Location Service</b> on or off.</li> </ul> <p data-bbox="459 642 846 663">Choose location mode (Android 4.4–8.1) ^</p> <p data-bbox="483 686 1127 705">You can choose your location mode based on accuracy, speed, and battery use.</p> <ol data-bbox="488 718 1227 785" style="list-style-type: none"> <li>1. Open your phone's Settings app.</li> <li>2. Tap <b>Security &amp; Location</b> &gt; <b>Location</b>. If you don't see "Security &amp; Location," tap <b>Location</b>.</li> <li>3. Tap <b>Mode</b>. Then pick:</li> </ol> <ul data-bbox="509 789 1317 917" style="list-style-type: none"> <li>• <b>High accuracy:</b> Use GPS, Wi-Fi, mobile networks, and sensors to get the most accurate location. Use Google Location Services to help estimate your phone's location faster and more accurately.</li> <li>• <b>Battery saving:</b> Use sources that use less battery, like Wi-Fi and mobile networks. Use Google Location Services to help estimate your phone's location faster and more accurately.</li> <li>• <b>Device only:</b> Use only GPS. Don't use Google Location Services to provide location information. This can estimate your phone's location more slowly and use more battery.</li> </ul> <p data-bbox="459 968 857 989">Choose location access (Android 4.1–4.3) ^</p> <p data-bbox="483 1012 993 1031">You can control what location information your phone can use.</p> <ol data-bbox="488 1043 1005 1113" style="list-style-type: none"> <li>1. Open your phone's Settings app.</li> <li>2. Under "Personal," tap <b>Location access</b>.</li> <li>3. At the top of the screen, turn <b>Access to my location</b> on or off.</li> </ol> <ul data-bbox="509 1115 1328 1266" style="list-style-type: none"> <li>• <b>When location access is on, pick either or both of:</b> <ul data-bbox="531 1138 1328 1222" style="list-style-type: none"> <li>• <b>GPS satellites:</b> Lets your phone estimate its location from satellite signals, like a GPS device in a car.</li> <li>• <b>Wi-Fi &amp; mobile network location:</b> Lets your phone use Google Location Services to help estimate its location faster, with or without GPS.</li> </ul> </li> <li>• <b>When location access is off:</b> <p data-bbox="531 1247 1068 1266">Your phone can't find its precise location or share it with any apps.</p> </li> </ul> <p data-bbox="483 1278 1328 1316"><b>Tip:</b> If you have a tablet that more than one person uses, each person can have different location access settings.</p> <p data-bbox="375 1344 1247 1373"><b>Attachment 40 (Manage your Pixel phone's location settings) at 3 &amp; 4.</b></p>

Claim 1	Corresponding Structure in Accused Systems
	<p>1. On your Android device, go to <b>Settings</b></p> <p>2. Tap <b>Location</b> and re-enable your location services</p> <p>3. Select <b>Mode High accuracy</b></p> <div data-bbox="613 363 1211 737">  </div> <div data-bbox="1219 359 1446 709"> <p>The user of the wireless device can select the method of the location estimation</p> </div> <p>On some phone models, this option can be found under the Advanced Settings option.</p> <p>Select <b>Advanced Settings</b> and enable your device to improve positioning accuracy by allowing apps to scan for Wi-Fi networks and Bluetooth devices at any time, even if Wi-Fi or Bluetooth is disabled.</p> <div data-bbox="613 930 1211 1310">  </div> <p><b>Attachment 33 (Google Maps Not Updating Location) at 4.</b></p>



**Claim 1****Corresponding Structure in Accused Systems**

	DESCRIPTION	OPT-IN / OPT-OUT	USER CHOICES
LOCATION SERVICES	"Use Google's location service to help apps determine your location. Anonymous location data will be sent to Google when your device is on."	Opt-Out	"YES, I'M IN" or "SKIP"
LOCATION ACCURACY	Three Modes - "High accuracy", "Battery saving", and "Device only". Default setting: "High accuracy use(s) GPS, Wi-Fi, Bluetooth, or cellular networks to determine location"	Opt-Out	Toggle icon (right and colored for on, left and gray for off). This setting not shown during Android set-up.
LOCATION SCANNING	"Improve location accuracy by allowing apps and services to scan for Wi-Fi and Bluetooth, even when those settings are off."	Opt-Out	Toggle icon (right and colored for on, left and gray for off).
LOCATION HISTORY	"[A]llows Google to store a history of your location data from all devices where you are logged into your Google Account and have enabled Location Reporting. Location History and Location Reporting data may be used by any Google app or service."	Opt-Out	"YES, I'M IN" or "NO THANKS"  In the context of "Give your new Assistant permission to help you"

Figure 1: Four Android settings and services that relate to location information collection.<sup>1</sup>

**Google Location Services**

Google Location Services (GLS) operate at a device level and rely on sensors such as GPS, Wi-Fi, the cellular radio, and other technologies included in mobile devices to position a user in the world. If a user keeps the default settings prompted by Google, Location Services is enabled, Location Accuracy will be set to "High Accuracy"<sup>2</sup> and Location Scanning will be enabled for both Wi-Fi base stations and Bluetooth Beacons, regardless of a user's choice to turn Wi-Fi or Bluetooth on. The implications of user choices among the various Location Services settings are significant, but not intuitive, including:

- With Location Services turned on, Location Accuracy set to "Device only" and Location Scanning turned off, an Android device will only use GPS to provide the location of an Android device.
- When Location Accuracy is set to "High accuracy" and Location Scanning is enabled (the default setting for new device setup), an Android device will use sources including Wi-Fi, Bluetooth, and cellular radio to improve the accuracy of the device's position.

**Attachment 38 (Google, Android and Location Tracking) at 2.**

**Claim 1****Corresponding Structure in Accused Systems**

After completing the setup process users can validate and control settings for device location via the Settings app and navigating to Google settings, then Location (Figure 4).

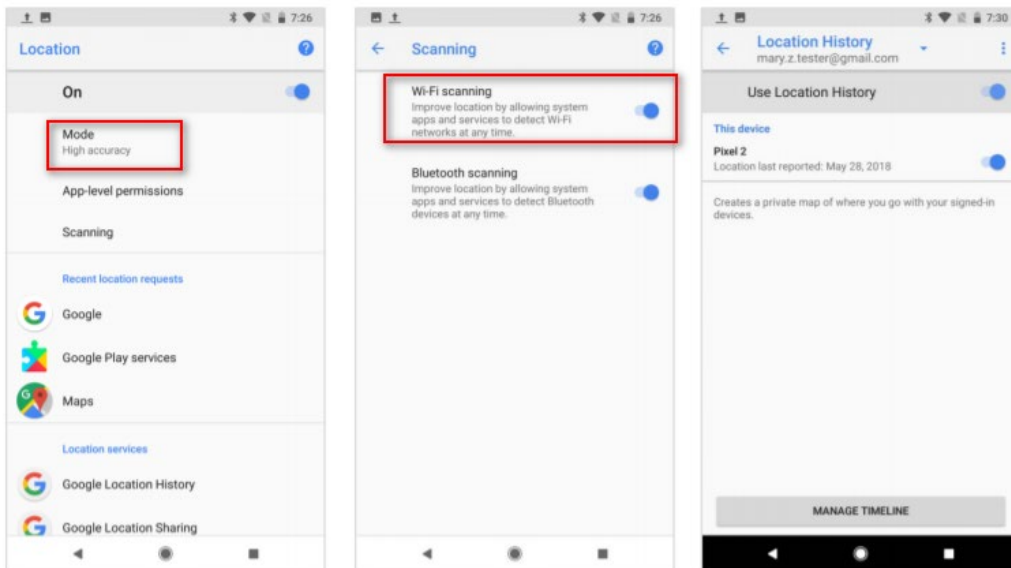
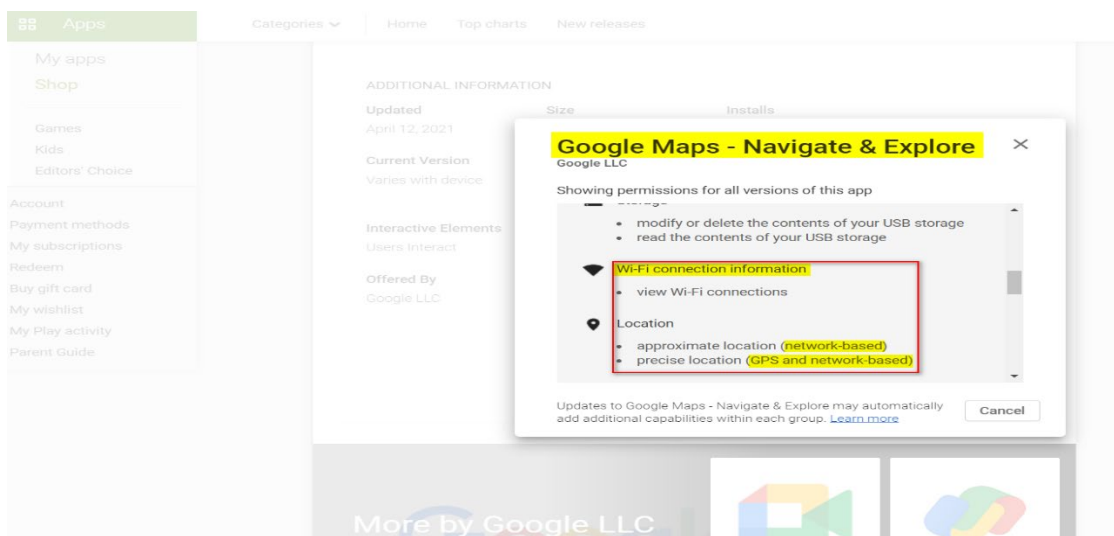


Figure 4: Location settings after Android device setup process

As demonstrated in Figure 4, if users accept Google's defaults during the setup process, the Android device is configured with Location Services enabled, Wi-Fi and Bluetooth scanning engaged, and Location History active.

**Attachment 38 (Google, Android and Location Tracking) at 5.**

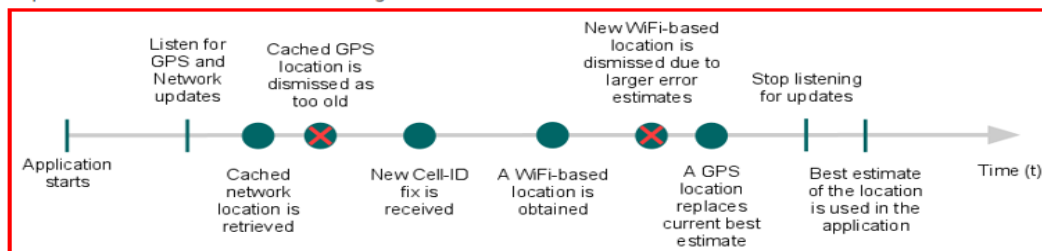
Claim 1	Corresponding Structure in Accused Systems
	<p>Users can choose to disable GLS during the set-up process. However, if a user attempts to disable GLS, a warning dialogue box prompts an extreme scenario: “device location for all apps is turned off and you may not be able to locate your device if it is lost.” (Figure 5) Note as well, the action prompt is to “Turn on Location” – reversing the user choice triggering the warning. Further, as described immediately below, many Google and third party apps will not function unless GLS is turned on. Therefore, Google forces user into an impossible ultimatum, have their every move constantly monitored, tracked, and stored or lose the functionality of their expensive smartphone.</p> <p>If a user disables Location Services but then attempts to use a location aware app or service on their device, she will see the dialogue box shown in Figure 6. If the user clicks “OK” the service is enabled for the entire device and permanently, rather than enabling Location Services only for that particular app or service requesting the functionality.</p> <div data-bbox="532 604 849 1083" data-label="Image"> </div> <p data-bbox="532 1094 849 1115">Figure 5: Location Services Warning</p> <div data-bbox="943 604 1271 1083" data-label="Image"> </div> <p data-bbox="980 1094 1234 1136">Figure 6: Re-Enable Location Services</p> <p><b>Attachment 38 (Google, Android and Location Tracking) at 6.</b></p> <p>We collect information about your location when you use our services, which helps us offer features like driving directions for your weekend getaway or showtimes for movies playing near you.</p> <p>Your location can be determined with varying degrees of accuracy by:</p> <ul style="list-style-type: none"> <li>• GPS</li> <li>• IP address</li> <li>• Sensor data from your device</li> <li>• Information about things near your device, such as Wi-Fi access points, cell towers, and Bluetooth-enabled devices</li> </ul> <p>The types of location data we collect depend in part on your device and account settings. For example, you can <a href="#">turn your Android device's location on or off</a> using the device's settings app. You can also <a href="#">turn on Location History</a> if you want to create a private map of where you go with your signed-in devices.</p> <p><b>Attachment 29 (Google Privacy Policy) at 4.</b></p>

**Claim 1****Corresponding Structure in Accused Systems****Attachment 39 (Google Map\_Permissions) at 1.****Flow for obtaining user location**




Here's the typical flow of procedures for obtaining the user location:

1. Start application.
2. Sometime later, start listening for updates from desired location providers.
3. Maintain a "current best estimate" of location by filtering out new, but less accurate fixes.
4. Stop listening for location updates.
5. Take advantage of the last best location estimate.





















Figure 1 demonstrates this model in a timeline that visualizes the period in which an application is listening for location updates and the events that occur during that time.

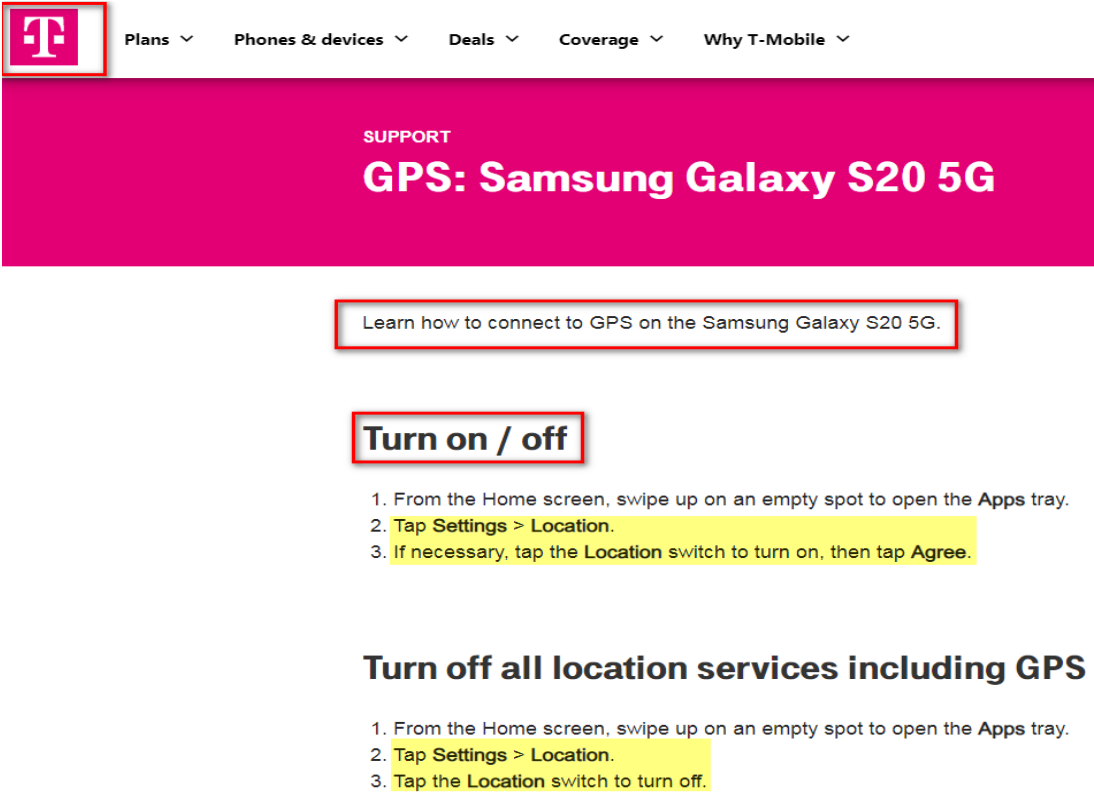
**Attachment 12 (Location is estimated using cell tower/wi-fi network) at 5.**




Claim 1	Corresponding Structure in Accused Systems
	<p><b>There are 3 location providers in Android.</b></p> <p>They are:</p> <p><b>gps → (GPS, AGPS):</b> Name of the GPS location provider. <b>This provider determines location using satellites.</b> Depending on conditions, this provider may take a while to return a location fix. Requires the permission <code>android.permission.ACCESS_FINE_LOCATION</code>.</p> <p><b>network → (AGPS, CellID, WiFi MACID):</b> Name of the network location provider. This provider <b>determines location based on availability of cell tower and WiFi access points.</b> Results are retrieved by means of a network lookup. Requires either of the permissions <code>android.permission.ACCESS_COARSE_LOCATION</code> or <code>android.permission.ACCESS_FINE_LOCATION</code>.</p> <p><b>passive → (CellID, WiFi MACID):</b> A special location provider for receiving locations without actually initiating a location fix. This provider can be used to passively receive location updates when other applications or services request them without actually requesting the locations yourself. This provider will return locations generated by other providers. Requires the permission <code>android.permission.ACCESS_FINE_LOCATION</code>, although if the GPS is not enabled this provider might only return coarse fixes. This is what Android calls these location providers, however, the underlying technologies to make this stuff work is mapped to the specific set of hardware and telco provided capabilities (network service).</p> <p><b>The best way is to use the “network” or “passive” provider first, and then fallback on “gps”, and depending on the task, switch between providers. This covers all cases, and provides a lowest common denominator service (in the worst case) and great service (in the best case).</b></p> <p><b>Attachment 41 (Android Location Providers - GPS or Network Provider?) at 1 &amp; 2.</b></p> <p>Accuracy</p> <p>You can specify location accuracy using the <code>setPriority()</code> method, passing one of the following values as the argument:</p> <ul style="list-style-type: none"> <li><b>PRIORITY_HIGH_ACCURACY</b> provides the most accurate location possible, which is computed using as many inputs as necessary (it enables GPS, Wi-Fi, and cell, and uses a variety of <code>Sensors</code>), and may cause significant battery drain.</li> <li><b>PRIORITY_BALANCED_POWER_ACCURACY</b> provides accurate location while optimizing for power. Very rarely uses GPS. Typically uses a combination of Wi-Fi and cell information to compute device location.</li> <li><b>PRIORITY_LOW_POWER</b> largely relies on cell towers and avoids GPS and Wi-Fi inputs, providing coarse (city-level) accuracy with minimal battery drain.</li> <li><b>PRIORITY_NO_POWER</b> receives locations passively from other apps for which location has already been computed.</li> </ul> <p>The location needs of most apps can be satisfied using the balanced power or low power options. High accuracy should be reserved for apps that are running in the foreground and require <i>real time</i> location updates (for example, a mapping app).</p> <p><b>Attachment 42 (Optimize location for battery) at 2.</b></p> <p><b>Traffic conditions</b> <a href="#">[edit]</a></p> <p>In 2007, Google began offering traffic data as a colored overlay on top of roads and motorways to represent the speed of vehicles on particular roads. Crowdsourcing is used to obtain the GPS-determined locations of a large number of cellphone users, from which live traffic maps are produced.<sup>[59][60][61]</sup></p> <p>Google has stated that the speed and location information it collects to calculate traffic conditions is anonymous.<sup>[62]</sup> Options available in each phone's settings allow users not to share information about their location with Google Maps.<sup>[63]</sup> Google stated, "Once you disable or opt out of My Location, Maps will not continue to send radio information back to Google servers to determine your handset's approximate location".<sup>[64][failed verification]</sup></p> <p><b>Attachment 43 (Google Maps Wikipedia) at 5 &amp; 6.</b></p>

Claim 1	Corresponding Structure in Accused Systems
<p>wherein the second processor selectively acquires the information indicative of a location of the wireless mobile communications device dependent on the setting of preference flags,</p>	<p>Plaintiff contends each Exhibit-B wireless mobile can set preference flags that enable or disable accessibility to data relevant to the device's location by Location-Based Services (LBS) providers. Such programmability by a wireless device is at times known as a privacy setting. Further, such programmability is available by location-permission granting (wireless mobile communications device must grant permission).</p> <p>The LBS providers' processors select to determine a wireless mobile communications device's location if the preference flags applicable to that device have been set for enablement. The processors select to not determine a wireless mobile communications device's location if the preference flags applicable to that device have not been set for enablement.</p> <p>The following exemplifies this limitation's existence in Accused Systems:</p> <div data-bbox="389 703 508 745">Settings</div> <div data-bbox="389 793 557 835">Location</div> <div data-bbox="389 850 1321 919" style="border: 2px solid red; padding: 5px;"> <p>Location services use a combination of GPS, mobile network and Wi-Fi to determine the location of your device.</p> </div> <div data-bbox="418 934 901 1018" style="background-color: yellow; padding: 5px;"> <ol style="list-style-type: none"> <li>1. From Settings, tap  Location.</li> <li>2. Tap  to turn on Location services.</li> </ol> </div> <div data-bbox="389 1033 1274 1075"> <p> <b>TIP</b> Some apps require location services be turned on for full functionality.</p> </div> <p><b>Attachment 15 (Turn ON/OFF the location setting) at 161.</b></p>

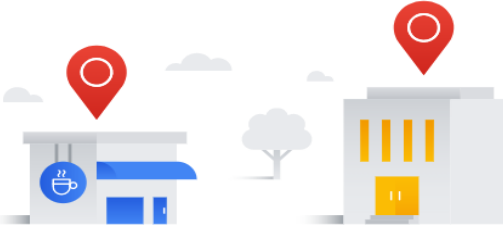


Claim 1	Corresponding Structure in Accused Systems
	<p><b>Status bar</b></p> <p>The Status bar provides device information on the right side and notification alerts on the left.</p> <p><b>Status icons</b></p> <div data-bbox="397 493 1299 829">  Battery full  Battery low  Charging  Mute  Vibrate </div> <div data-bbox="397 661 1299 829">  Airplane mode  Bluetooth active  Wi-Fi active  Location active  Alarm </div> <p><b>Notification icons</b></p> <div data-bbox="397 924 1299 1239">  Missed calls  Call in progress  Call on hold  New message  Voicemail </div> <div data-bbox="397 1092 1299 1239">  New email  Download  Upload  Wi-Fi available  App update </div> <div data-bbox="1315 766 1526 1239" style="border: 1px solid black; border-radius: 10px; padding: 10px;"> <p>Google Map hardware/software will be able/not able to locate the Wireless communication device (Exhibit B) if "Location" flag is turned ON/OFF respectively</p> </div> <p><b>Attachment 15 (Icon for turn ON/OFF the location setting) at 161.</b></p>

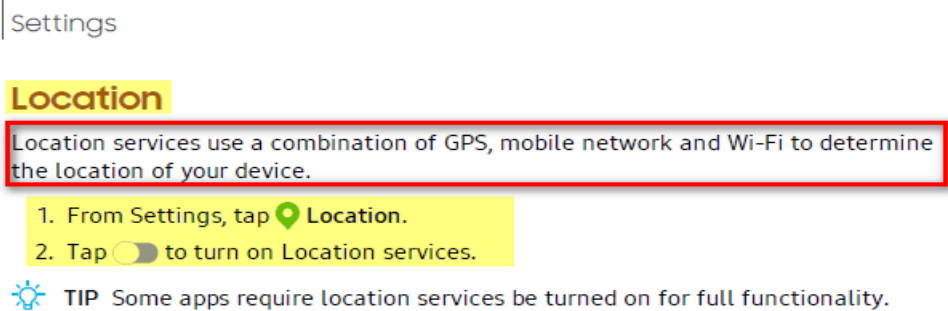
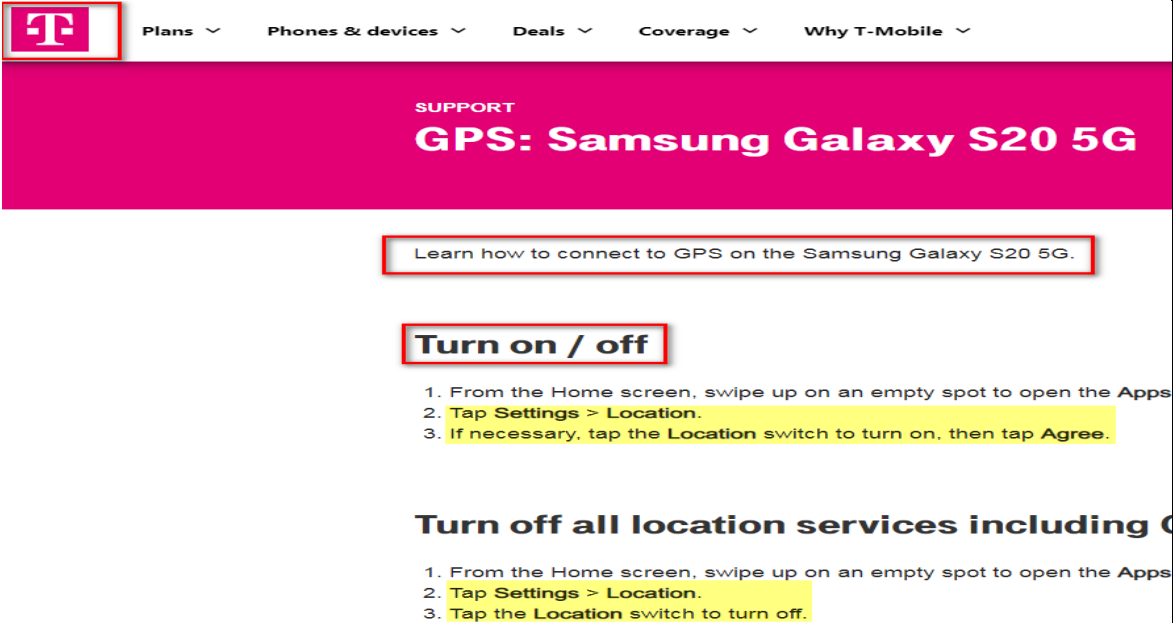
Claim 1	Corresponding Structure in Accused Systems
	 <p>The screenshot shows the T-Mobile support page for Samsung Galaxy S20 5G. The page has a pink header with the T-Mobile logo and navigation links: Plans, Phones &amp; devices, Deals, Coverage, and Why T-Mobile. Below the header is a pink banner with the text 'SUPPORT' and 'GPS: Samsung Galaxy S20 5G'. A red box highlights the text 'Learn how to connect to GPS on the Samsung Galaxy S20 5G.' Below this is a section titled 'Turn on / off' with a list of steps: 1. From the Home screen, swipe up on an empty spot to open the Apps tray. 2. Tap Settings &gt; Location. 3. If necessary, tap the Location switch to turn on, then tap Agree. Below this is a section titled 'Turn off all location services including GPS' with a list of steps: 1. From the Home screen, swipe up on an empty spot to open the Apps tray. 2. Tap Settings &gt; Location. 3. Tap the Location switch to turn off.</p> <p><b>Attachment 19 (Turn ON/OFF the location) at 1.</b></p>

Claim 1	Corresponding Structure in Accused Systems
	<div data-bbox="402 247 683 359">  </div> <div data-bbox="1222 241 1388 270"> <a href="#">Personal</a> <a href="#">Business</a> </div> <div data-bbox="1222 306 1503 342"> <a href="#">Shop</a> <a href="#">Why Verizon</a> <a href="#">Support</a> </div> <hr/> <div data-bbox="414 508 1086 535"> <a href="#">Home</a> &gt; <a href="#">Support</a> &gt; <a href="#">Google</a> &gt; <a href="#">Google Pixel 4a</a> &gt; <b>Google Pixel 4a - Turn GPS Location On / Off</b> </div> <div data-bbox="410 625 1312 791"> <h1>Google Pixel 4a - Turn GPS Location On / Off</h1> </div> <div data-bbox="414 905 1250 942"> <p>⬠ Satellite or standalone GPS services require more power and have a greater effect on battery life.</p> </div> <div data-bbox="414 978 920 1228"> <ol style="list-style-type: none"> <li>1. From a Home screen, swipe up to display all apps.</li> <li>2. Navigate: <b>Settings</b> &gt; <b>Location</b>.</li> <li>3. Tap the <b>Use location switch</b> to turn on  or off . → You must turn this feature on to adjust GPS services.</li> <li>4. If presented, review the disclaimer(s) then tap <b>AGREE</b>.</li> </ol> </div> <div data-bbox="1101 984 1450 1167"> <p>Google Map hardware/software will be able/not able to locate the Wireless communication device (Exhibit B) if “Location” flag is turned ON/OFF respectively</p> </div> <div data-bbox="375 1302 980 1333"> <p><b>Attachment 20 (Turn ON/OFF the location) at 1.</b></p> </div>

Claim 1	Corresponding Structure in Accused Systems
	<p data-bbox="396 226 1417 300">Help your phone get a more accurate location (Google Location Services a.k.a. Google Location Accuracy)</p> <p data-bbox="396 342 1019 373"><b>Turn your phone's location accuracy on or off</b></p> <ol data-bbox="396 388 964 478" style="list-style-type: none"> <li>1. Open your device's Settings app.</li> <li>2. Tap Location &gt; Advanced &gt; Google Location Accuracy.</li> <li>3. Turn Improve Location Accuracy on or off.</li> </ol> <hr/> <p data-bbox="418 520 818 541">When Google Location Accuracy is on ^</p> <div data-bbox="444 573 1370 625"> <p>When you have Google Location Accuracy turned on, your phone uses these sources to get the most accurate location:</p> <ul data-bbox="444 640 630 772" style="list-style-type: none"> <li>• GPS</li> <li>• Wi-Fi</li> <li>• Mobile networks</li> <li>• Sensors</li> </ul> </div> <div data-bbox="867 646 1458 772"> <p>Wireless communication device receive the location of the Wireless communication device (Exhibit B) on Google Map from Wireless communication networks (e.g. Verizon, AT&amp;T, T-Mobile, etc.)</p> </div> <hr/> <p data-bbox="418 835 818 856">When Google Location Accuracy is off v</p> <hr/> <p data-bbox="396 919 1110 951"><b>Let your phone scan for nearby networks or devices</b></p> <p data-bbox="396 966 1398 1014">To help apps get better location info, you can let your phone scan for nearby Wi-Fi access points or Bluetooth devices.</p> <ol data-bbox="396 1035 911 1125" style="list-style-type: none"> <li>1. Open your device's Settings app.</li> <li>2. Tap Location &gt; Wi-Fi and Bluetooth scanning.</li> <li>3. Turn Wi-Fi scanning or Bluetooth scanning on or off.</li> </ol> <p data-bbox="375 1146 1195 1178"><b>Attachment 21 (Manage your Pixel phone's location settings) at 2.</b></p>


Claim 1	Corresponding Structure in Accused Systems
	<p data-bbox="391 226 708 258">Your location information</p>  <p data-bbox="391 636 1430 688">We collect information about your location when you use our services, which helps us offer features like driving directions for your weekend getaway or showtimes for movies playing near you.</p> <p data-bbox="391 730 992 751">Your location can be determined with varying degrees of accuracy by:</p> <ul data-bbox="391 793 1414 982" style="list-style-type: none"> <li>• GPS</li> <li>• <a href="#">IP address</a></li> <li>• <a href="#">Sensor data from your device</a></li> <li>• <a href="#">Information about things near your device, such as Wi-Fi access points, cell towers, and Bluetooth-enabled devices</a></li> </ul> <p data-bbox="391 1024 1438 1108">The types of location data we collect depend in part on your device and account settings. For example, you can <a href="#">turn your Android device's location on or off</a> using the device's settings app. You can also turn on <a href="#">Location History</a> if you want to create a private map of where you go with your signed-in devices.</p> <p data-bbox="370 1140 919 1171"><b>Attachment 29 (Google privacy policy) at 4.</b></p>
<p data-bbox="99 1192 342 1696">wherein the second processor acquires the information indicative of a location of the wireless mobile communications device if the preference flags are set to a state that permits tracking of the wireless mobile communications device,</p>	<p data-bbox="370 1192 1507 1444">Plaintiff contends each Exhibit-B wireless mobile can set preference flags that enable or disable accessibility to data relevant to the device's location by Location-Based Services (LBS) providers. The LBS providers' processors select to determine a wireless mobile communications device's location if the preference flags applicable to that device have been set for enablement. The processors select to not determine a wireless mobile communications device's location if the preference flags applicable to that device have not been set for enablement.</p> <p data-bbox="370 1465 1523 1833">The Navigation hardware/software will only be able to determine and track the location of the Wireless communication device (Exhibit B) such as but not limited to including but not limited to Google's branded devices such as Google Pixel 5, pixel 4a 5G, pixel 4a, pixel 4 XL, pixel 4, pixel 3a XL, pixel 3a, pixel 3 XL, pixel 3, pixel 2, pixel 2 XL, pixel XL, pixel, pixel C or other (third-parties) branded devices such as Samsung Galaxy S20 Ultra, Galaxy S20 plus, Galaxy S20, Galaxy Z fold, Galaxy S10, Galaxy A series, etc. (refer Exhibit B for complete list), Plaintiff contends each Exhibit-B wireless mobile can set preference flags that enable or disable accessibility to data relevant to the device's location by Location-Based Services (LBS) providers. Such programmability by a wireless device is at times known as a privacy setting. Further, such programmability is available by location-permission granting (wireless mobile communications device must grant permission).</p> <p data-bbox="370 1854 1425 1921">Plaintiff contends that if the preference flags are enabled (i.e., the wireless mobile communication device's user has granted permission, LBS providers' processors)</p>

Screenshot of the "Location setting" associated with Google Maps app installed on an Android communications device.




Claim 1	Corresponding Structure in Accused Systems
	<p>proceed with determining the device's location and, when determined, communicates that location to the first processor through the second RF transceiver (which, as discussed above, is a transceiver to which the LBS-providers' processors communicatively couple). The LBS-providers' processors are programmed to estimate the location of the device from 3 sources: GPS (GPS uses satellites and knows your location within a few meters), Wi-Fi (the location of nearby Wi-Fi networks helps Maps know where you are), and cell towers (cell tower can be accurate up to a few thousand meters).</p> <p>The following exemplifies this limitation's existence in Accused Systems:</p>  <p>Attachment 15 (Turn ON/OFF the location setting) at 161.</p>  <p>Attachment 19 (Turn ON/OFF the location) at 1.</p>



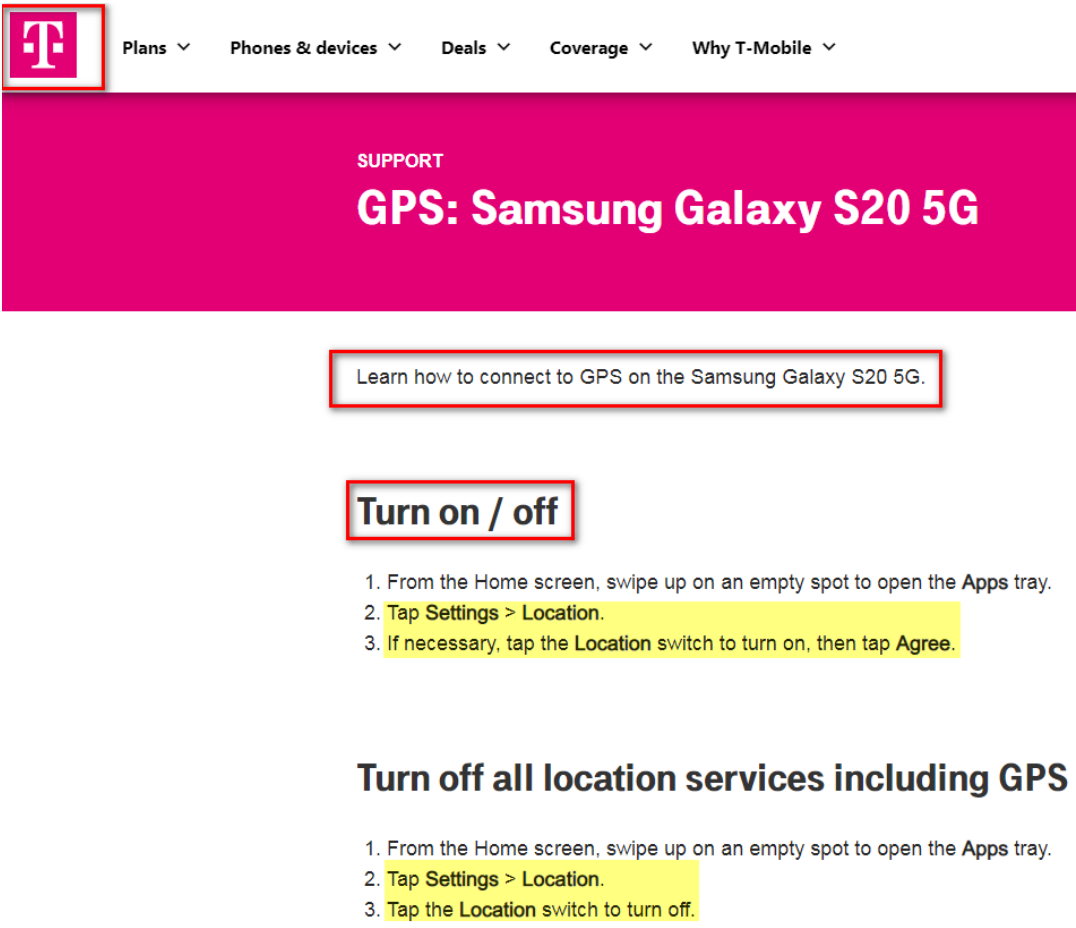
Claim 1	Corresponding Structure in Accused Systems
	<div data-bbox="391 226 699 264" data-label="Text"> <p>Your location information</p> </div> <div data-bbox="643 312 1138 535" data-label="Image"> <p>The illustration shows two stylized buildings. The building on the left is blue and has a coffee cup icon on its front. The building on the right is grey and has a yellow door. Above each building is a red location pin with a white circle in the center. There are also some grey clouds and a tree in the background.</p> </div> <div data-bbox="391 625 1427 684" data-label="Text"> <p>We collect information about your location when you use our services, which helps us offer features like driving directions for your weekend getaway or showtimes for movies playing near you.</p> </div> <div data-bbox="391 720 980 743" data-label="Text"> <p>Your location can be determined with varying degrees of accuracy by:</p> </div> <div data-bbox="391 781 1396 966" data-label="List-Group"> <ul style="list-style-type: none"> <li>• GPS</li> <li>• <a href="#">IP address</a></li> <li>• <a href="#">Sensor data from your device</a></li> <li>• <a href="#">Information about things near your device, such as Wi-Fi access points, cell towers, and Bluetooth-enabled devices</a></li> </ul> </div> <div data-bbox="391 1003 1421 1085" data-label="Text"> <p>The types of location data we collect depend in part on your device and account settings. For example, you can <a href="#">turn your Android device's location on or off</a> using the device's settings app. You can also turn on <a href="#">Location History</a> if you want to create a private map of where you go with your signed-in devices.</p> </div> <div data-bbox="362 1121 922 1157" data-label="Text"> <p><b>Attachment 29 (Google privacy policy) at 4.</b></p> </div>

Claim 1	Corresponding Structure in Accused Systems
	<div data-bbox="402 262 682 373">  </div> <div data-bbox="1222 258 1503 359"> <a href="#">Personal</a> <a href="#">Business</a>  <a href="#">Shop</a> <a href="#">Why Verizon</a> <a href="#">Support</a> </div> <hr/> <div data-bbox="410 525 1088 552"> <a href="#">Home</a> &gt; <a href="#">Support</a> &gt; <a href="#">Google</a> &gt; <a href="#">Google Pixel 4a</a> &gt; <b>Google Pixel 4a - Turn GPS Location On / Off</b> </div> <div data-bbox="406 642 1312 808"> <h2>Google Pixel 4a - Turn GPS Location On / Off</h2> </div> <p>⬠ Satellite or standalone GPS services require more power and have a greater effect on battery life.</p> <ol style="list-style-type: none"> <li>1. From a Home screen, swipe up to display all apps.</li> <li>2. Navigate: <b>Settings</b> &gt; <b>Location</b>.</li> <li>3. Tap the <b>Use location switch</b> to turn on  or off . → You must turn this feature on to adjust GPS services.</li> <li>4. If presented, review the disclaimer(s) then tap <b>AGREE</b>.</li> </ol> <p><b>Attachment 20 (Turn ON/OFF the location) at 1.</b></p>




Claim 1	Corresponding Structure in Accused Systems
	<p data-bbox="386 233 987 275"><b>Turn location on or off for your phone</b></p> <ol data-bbox="394 289 919 386" style="list-style-type: none"> <li>1. Open your phone's Settings app.</li> <li>2. <b>Tap Location.</b> If you have a work profile, tap Advanced.</li> <li>3. <b>At the top, turn Use location on or off.</b></li> </ol> <p data-bbox="386 407 1315 432">Tip: You can also turn your phone's location on or off with Quick Settings. <a href="#">Learn about Quick Settings.</a></p> <hr/> <p data-bbox="407 474 630 506"><b>When Location is on</b></p> <ul data-bbox="440 537 1421 861" style="list-style-type: none"> <li>• Apps can find your phone's location to give you location-based info or services. <a href="#">Learn how to change app location settings.</a></li> <li>• If Google Location Accuracy is on, Google Location Services can collect data to improve location-based services. <a href="#">Learn about Google Location Services.</a></li> <li>• You can get search results and ads in apps based on your phone's location.</li> <li>• You can locate where your phone is if you lose it. <a href="#">Learn about Find My Device.</a></li> <li>• You can share your phone's location with others. <a href="#">Learn about Location Sharing with Google Maps and sending location in emergencies.</a></li> <li>• If you have Location History turned on, the places your phone goes will be saved. You can review and manage them later. <a href="#">Learn about Location History.</a></li> </ul> <p data-bbox="373 888 1065 919"><b>Attachment 21 (Manage your pixel phone settings) at 1.</b></p> <p data-bbox="394 955 1385 1031">Help your phone get a more accurate location (Google Location Services a.k.a. Google Location Accuracy)</p> <p data-bbox="394 1066 1000 1098"><b>Turn your phone's location accuracy on or off</b></p> <ol data-bbox="402 1113 946 1199" style="list-style-type: none"> <li>1. Open your device's Settings app.</li> <li>2. Tap <b>Location</b> &gt; <b>Advanced</b> &gt; <b>Google Location Accuracy.</b></li> <li>3. Turn <b>Improve Location Accuracy</b> on or off.</li> </ol> <hr/> <p data-bbox="415 1239 805 1264"><b>When Google Location Accuracy is on</b></p> <p data-bbox="440 1293 1341 1344">When you have Google Location Accuracy turned on, your phone uses these sources to get the most accurate location:</p> <ul data-bbox="440 1358 621 1478" style="list-style-type: none"> <li>• GPS</li> <li>• <b>Wi-Fi</b></li> <li>• <b>Mobile networks</b></li> <li>• Sensors</li> </ul> <p data-bbox="906 1350 1341 1528">Wireless communication device receive the location of the Wireless communication device (Exhibit B) on Google Map from Wireless communication networks (e.g. Verizon, AT&amp;T, T-Mobile, etc.)</p> <p data-bbox="415 1543 810 1568"><b>When Google Location Accuracy is off</b></p> <hr/> <p data-bbox="394 1627 1089 1659"><b>Let your phone scan for nearby networks or devices</b></p> <p data-bbox="394 1673 1369 1719">To help apps get better location info, you can let your phone scan for nearby Wi-Fi access points or Bluetooth devices.</p> <ol data-bbox="402 1738 893 1824" style="list-style-type: none"> <li>1. Open your device's Settings app.</li> <li>2. <b>Tap Location</b> &gt; <b>Wi-Fi and Bluetooth scanning.</b></li> <li>3. Turn <b>Wi-Fi scanning</b> or <b>Bluetooth scanning</b> on or off.</li> </ol> <p data-bbox="373 1848 1195 1879"><b>Attachment 21 (Manage your Pixel phone's location settings) at 2.</b></p>

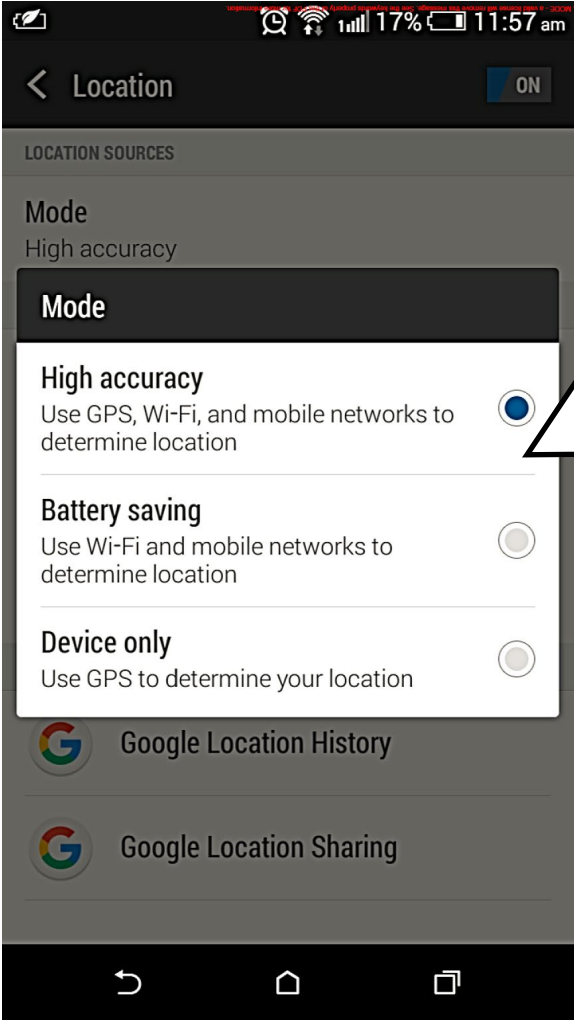
Claim 1	Corresponding Structure in Accused Systems
<p>and wherein the second processor does not acquire the information indicative of the location of the wireless mobile communications device if the preference flags are set to a state that prohibits tracking of the wireless mobile communications device.</p>	<p>Plaintiff contends that if the preference flags are not enabled (i.e., the wireless-mobile-communication device's user has not granted permission), LBS provider application hardware/software, will not be able to determine and track the location of the Wireless communication device (Exhibit B) such as but not limited to Google's branded devices such as Google Pixel 5, pixel 4a 5G, pixel 4a, pixel 4 XL, pixel 4, pixel 3a XL, pixel 3a, pixel 3 XL, pixel 3, pixel 2, pixel 2 XL, pixel XL, pixel, pixel C or other (third-parties) branded devices such as Samsung Galaxy S20 Ultra, Galaxy S20 plus, Galaxy S20, Galaxy Z fold, Galaxy S10, Galaxy A series, etc. (refer Exhibit B for complete list), if the location flag on the Wireless communication device (Exhibit B) is turned off (that is, locations privacy settings are set to "Deny").</p> <p>The following exemplifies this limitation's existence in Accused Systems:</p> <div data-bbox="389 667 506 709">Settings</div> <div data-bbox="389 772 555 814">Location</div> <div data-bbox="389 835 1328 909"> <p>Location services use a combination of GPS, mobile network and Wi-Fi to determine the location of your device.</p> </div> <div data-bbox="418 930 901 1024"> <ol style="list-style-type: none"> <li>1. From Settings, tap  Location.</li> <li>2. Tap  to turn on Location services.</li> </ol> </div> <div data-bbox="389 1045 1279 1087"> <p> TIP Some apps require location services be turned on for full functionality.</p> </div> <p><b>Attachment 15 (Turn ON/OFF the location setting) at 161.</b></p>



Claim 1	Corresponding Structure in Accused Systems
	<div data-bbox="391 226 716 268" data-label="Text"> <p>Your location information</p> </div> <div data-bbox="662 321 1174 552" data-label="Image"> </div> <div data-bbox="391 636 1471 709" data-label="Text"> <p>We collect information about your location when you use our services, which helps us offer features like driving directions for your weekend getaway or showtimes for movies playing near you.</p> </div> <div data-bbox="399 741 1003 764" data-label="Text"> <p>Your location can be determined with varying degrees of accuracy by:</p> </div> <div data-bbox="399 806 1438 999" data-label="List-Group"> <ul style="list-style-type: none"> <li>• GPS</li> <li>• <a href="#">IP address</a></li> <li>• <a href="#">Sensor data from your device</a></li> <li>• <a href="#">Information about things near your device</a>, such as Wi-Fi access points, cell towers, and Bluetooth-enabled devices</li> </ul> </div> <div data-bbox="399 1037 1463 1121" data-label="Text"> <p>The types of location data we collect depend in part on your device and account settings. For example, you can <a href="#">turn your Android device's location on or off</a> using the device's settings app. You can also turn on <a href="#">Location History</a> if you want to create a private map of where you go with your signed-in devices.</p> </div> <div data-bbox="370 1157 920 1192" data-label="Text"> <p><b>Attachment 29 (Google privacy policy) at 4.</b></p> </div>


Claim 1	Corresponding Structure in Accused Systems
	 <p>The screenshot shows the T-Mobile support page for Samsung Galaxy S20 5G. The page has a pink header with the T-Mobile logo and navigation links: Plans, Phones &amp; devices, Deals, Coverage, and Why T-Mobile. Below the header, the word 'SUPPORT' is followed by the title 'GPS: Samsung Galaxy S20 5G'. A red box highlights the text 'Learn how to connect to GPS on the Samsung Galaxy S20 5G.' Below this, another red box highlights the section 'Turn on / off'. Under this section, there are three numbered steps: 1. From the Home screen, swipe up on an empty spot to open the Apps tray. 2. Tap Settings &gt; Location. 3. If necessary, tap the Location switch to turn on, then tap Agree. Below this, there is a section titled 'Turn off all location services including GPS' with three numbered steps: 1. From the Home screen, swipe up on an empty spot to open the Apps tray. 2. Tap Settings &gt; Location. 3. Tap the Location switch to turn off.</p> <p><b>Attachment 19 (Turn ON/OFF the location) at 1.</b></p>



Claim 1	Corresponding Structure in Accused Systems
	<div data-bbox="402 247 682 357">  </div> <div data-bbox="1222 241 1503 344"> <p>Personal Business</p> <p>Shop Why Verizon Support</p> </div> <div data-bbox="410 510 1088 537"> <p>Home &gt; Support &gt; Google &gt; Google Pixel 4a &gt; Google Pixel 4a - Turn GPS Location On / Off</p> </div> <div data-bbox="410 627 1312 795"> <h2>Google Pixel 4a - Turn GPS Location On / Off</h2> </div> <div data-bbox="410 907 1250 947"> <p>📍 Satellite or standalone GPS services require more power and have a greater effect on battery life.</p> </div> <div data-bbox="410 982 920 1232"> <ol style="list-style-type: none"> <li>1. From a Home screen, swipe up to display all apps.</li> <li>2. Navigate: <b>Settings</b> &gt; <b>Location</b>.</li> <li>3. Tap the <b>Use location switch</b> to turn on  or off .</li> <li>4. If presented, review the disclaimer(s) then tap <b>AGREE</b>.</li> </ol> </div> <div data-bbox="1227 980 1421 1278"> <p>Google Map hardware/software will be not able to locate the Wireless communication device (Exhibit B) if "Location" flag is turned OFF</p> </div> <div data-bbox="375 1306 982 1337"> <p><b>Attachment 20 (Turn ON/OFF the location) at 1.</b></p> </div> <div data-bbox="810 1459 1399 1484"> <p>Manage your Pixel phone's location settings - Pixel Phone Help</p> </div> <div data-bbox="375 1520 600 1549"> <p><b>When Location is off</b></p> </div> <div data-bbox="410 1581 1357 1869"> <ul style="list-style-type: none"> <li>• Your phone's location isn't shared with any apps. Features that use location may not work properly.</li> <li>• Google Location Services won't collect data to improve location-based services.</li> <li>• You can get search results and ads based on your IP address.</li> <li>• You can't see where your phone is if you lose it. <a href="#">Learn about Find My Device.</a></li> <li>• You can't share your phone's location with anyone <b>via Google Maps</b>. Your device can still send it to first responders in an emergency. Learn about <a href="#">Location Sharing with Google Maps</a> and <a href="#">sending location in emergencies</a>.</li> <li>• Even if you have Location History turned on, the places your phone goes won't be saved. <a href="#">Learn about Location History.</a></li> </ul> </div>

Claim 1	Corresponding Structure in Accused Systems
	<p data-bbox="375 224 1065 254"><b>Attachment 21 (Manage your pixel phone settings) at 1.</b></p> <div data-bbox="375 569 945 1583">  <p>The screenshot shows the 'Location' settings page on an Android phone. At the top, there's a back arrow, the word 'Location', and a toggle switch labeled 'ON'. Below this is a section titled 'LOCATION SOURCES'. Underneath, the 'Mode' is set to 'High accuracy'. A list of three modes is shown: 'High accuracy' (selected with a blue circle), 'Battery saving', and 'Device only'. Each mode has a brief description of how it determines location. At the bottom, there are links for 'Google Location History' and 'Google Location Sharing'.</p> </div> <div data-bbox="1052 638 1490 1556"> <p>By default the “Location setting” is set at “High accuracy” mode, wherein, for example, accuracy of location of a communications device determined based on locations of nearby Wi-Fi network infrastructure (access points or hotspots) is further enhanced or fine-tuned by Google Maps Server additionally using the said communications device’s GPS location and the location data obtained from the mobile network (Cell tower information and/or Location of the communications device determined through the Assisted-GPS method by the said mobile network) serving the said communications device.</p> </div> <p data-bbox="375 1625 1211 1654"><b>Attachment 45 (Google Maps_Android app_Location settings) at 1.</b></p>

Claim 1	Corresponding Structure in Accused Systems
	<div><h2>Find and improve your location's accuracy</h2><p>Sometimes Google Maps might have trouble finding where you are located. If the GPS location of your blue dot on the map is inaccurate or the blue dot is not showing up, here are some things you can do to help fix the problem.</p><p>Tip: This will also improve your search results and make them more relevant to you.</p><div><div>Computer</div><div><b>Android</b></div><div>iPhone &amp; iPad</div></div><hr/><h3>See your current location on the map</h3><ol style="list-style-type: none"><li>1. On your Android phone or tablet, open the Google Maps app .</li><li>2. You'll see a blue dot, which shows where you are. If you don't see a blue dot, go to the bottom and tap Your location .</li></ol><h3>How Maps finds your current location</h3><p>Maps estimates where you are from sources like:</p><ul style="list-style-type: none"><li>• <b>GPS:</b> This uses satellites and knows your location up to around 20 meters. <b>Note:</b> When you're inside buildings or underground, the GPS is sometimes inaccurate.</li><li>• <b>Wi-Fi:</b> The location of nearby Wi-Fi networks helps Maps know where you are.</li><li>• <b>Cell tower:</b> Your connection to a cellular network can be accurate up to a few thousand meters.</li></ul><p><b>Attachment 46 (Find and improve your location's accuracy - Android - Google Maps Help) at 1.</b></p></div>

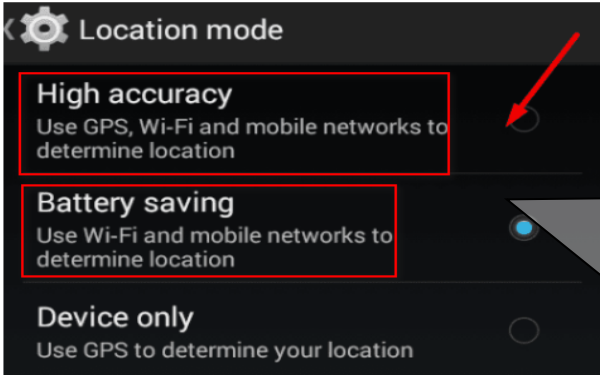
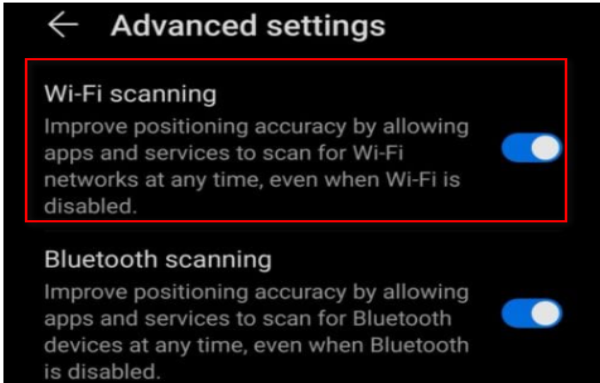
Claim 1	Corresponding Structure in Accused Systems
	<p><b>From your devices</b></p> <p>Many devices, like phones or computers, can work out their precise location. You can allow Google and other apps to provide you with useful features based on where your device is located. For example, if you're running late to meet your friends, you'll probably want to use a navigation app to know the quickest way to get to your destination. To get turn-by-turn directions, you may need to turn on your device's location and give the app the permission to access it. Or for some searches like "coffee shop", "bus stop" or "atm", results will usually be more helpful when precise location is available.</p> <p>On your Android device, if you choose to <b>turn on</b> your device location, you can use features like navigation, giving an app access to your current location, or find your phone. You can also choose which apps have permission to use your device's location with simple controls that let you turn the permission on or off for individual apps. On Android, you can see when an app is requesting to use your phone's GPS-based location when the top of your screen shows Location  <a href="#">Learn more</a></p> <p><b>Google Location Services</b></p> <p>On most Android devices, Google, as the network location provider, provides a location service called Google Location Services (GLS), known in Android 9 and above as Google Location Accuracy. This service aims to provide a more accurate device location and generally improve location accuracy. <b>Most mobile phones are equipped with GPS, which uses signals from satellites to determine a device's location</b> – however, with Google Location Services, additional information from nearby <b>Wi-Fi, mobile networks, and device sensors can be collected to determine your device's location</b>. It does this by periodically collecting location data from your device and using it in an anonymous way to improve location accuracy.</p> <p>You can disable Google Location Services at any time in your device's location settings. Your device's location will continue to work even if GLS is turned off, but the device will rely only on GPS to estimate device location for apps with the necessary permission. Google Location Services is distinct from your device's location setting. <a href="#">Learn more</a></p> <p><b>The settings and permissions on Android control whether your device sensors (like GPS) or network-based location (like GLS) are used to determine your location and which apps have access to that location.</b> They do not impact how websites and apps might estimate your location in other ways, such as from your IP Address.</p> <p><b>Attachment 44 (How Google uses location information – Privacy &amp; Terms – Google) at 2 &amp;3.</b></p>

Wireless communication device receive the location of the Wireless communication device (Exhibit B) on Google Map from Wireless communication networks (e.g. Verizon, AT&T, T-Mobile, etc.)

Claim 1	Corresponding Structure in Accused Systems
	<p><b>Turn your phone's location accuracy on or off</b></p> <p>1. Open your device's Settings app. 2. Tap Location &gt; Advanced &gt; Google Location Accuracy. 3. Turn Improve Location Accuracy on or off.</p> <hr/> <p><a href="#">When Google Location Accuracy is on</a></p> <p>When you have Google Location Accuracy turned on, your phone uses these sources to get the most accurate location:</p> <ul style="list-style-type: none"><li>• GPS</li><li>• <b>Wi-Fi</b></li><li>• <b>Mobile networks</b></li><li>• Sensors</li></ul> <p><a href="#">When Google Location Accuracy is off</a></p> <p>When you turn off Google Location Accuracy, your phone uses only GPS to find location. GPS can be slower and less accurate than other sources.</p> <p><b>Let your phone scan for nearby networks or devices</b></p> <p>To help apps get better location info, you can let your phone scan for nearby Wi-Fi access points or Bluetooth devices.</p> <p>1. Open your device's Settings app. <b>2. Tap Location &gt; Wi-Fi and Bluetooth scanning.</b> 3. Turn Wi-Fi scanning or Bluetooth scanning on or off.</p> <p><b>Attachment 21 (Manage your Pixel phone's location settings) at 2.</b></p>

Claim 1	Corresponding Structure in Accused Systems
	<p data-bbox="391 239 878 268">If you use an older Android version</p> <p data-bbox="410 296 769 319">Choose location settings (Android 9.0) ^</p> <p data-bbox="433 342 664 361">To change location settings:</p> <ol data-bbox="440 373 808 441" style="list-style-type: none"> <li>1. Open your device's Settings app.</li> <li>2. Tap <b>Security &amp; Location</b> &gt; <b>Location</b>. <ul style="list-style-type: none"> <li>• If you have a work profile, tap <b>Advanced</b>.</li> </ul> </li> </ol> <p data-bbox="433 453 628 472">Then, choose an option:</p> <ul data-bbox="440 485 1276 592" style="list-style-type: none"> <li>• Turn Location on or off: Tap <b>Location</b>.</li> <li>• Scan for nearby networks: Tap <b>Advanced</b> &gt; <b>Scanning</b>. Turn Wi-Fi scanning or Bluetooth scanning on or off.</li> <li>• Turn emergency location service on or off: Tap <b>Advanced</b> &gt; <b>Google Emergency Location Service</b>. Turn <b>Emergency Location Service</b> on or off.</li> </ul> <p data-bbox="410 642 794 663">Choose location mode (Android 4.4–8.1) ^</p> <p data-bbox="433 686 1076 705">You can choose your location mode based on accuracy, speed, and battery use.</p> <ol data-bbox="440 718 1175 785" style="list-style-type: none"> <li>1. Open your phone's Settings app.</li> <li>2. Tap <b>Security &amp; Location</b> &gt; <b>Location</b>. If you don't see "Security &amp; Location," tap <b>Location</b>.</li> <li>3. Tap <b>Mode</b>. Then pick:</li> </ol> <ul data-bbox="462 791 1263 917" style="list-style-type: none"> <li>• <b>High accuracy:</b> Use GPS, Wi-Fi, mobile networks, and sensors to get the most accurate location. Use Google Location Services to help estimate your phone's location faster and more accurately.</li> <li>• <b>Battery saving:</b> Use sources that use less battery, like Wi-Fi and mobile networks. Use Google Location Services to help estimate your phone's location faster and more accurately.</li> <li>• <b>Device only:</b> Use only GPS. Don't use Google Location Services to provide location information. This can estimate your phone's location more slowly and use more battery.</li> </ul> <p data-bbox="410 968 805 989">Choose location access (Android 4.1–4.3) ^</p> <p data-bbox="433 1012 941 1031">You can control what location information your phone can use.</p> <ol data-bbox="440 1043 954 1113" style="list-style-type: none"> <li>1. Open your phone's Settings app.</li> <li>2. Under "Personal," tap <b>Location access</b>.</li> <li>3. At the top of the screen, turn <b>Access to my location</b> on or off.</li> </ol> <ul data-bbox="462 1117 1276 1266" style="list-style-type: none"> <li>• <b>When location access is on, pick either or both of:</b> <ul style="list-style-type: none"> <li>• <b>GPS satellites:</b> Lets your phone estimate its location from satellite signals, like a GPS device in a car.</li> <li>• <b>Wi-Fi &amp; mobile network location:</b> Lets your phone use Google Location Services to help estimate its location faster, with or without GPS.</li> </ul> </li> <li>• <b>When location access is off:</b> Your phone can't find its precise location or share it with any apps.</li> </ul> <p data-bbox="433 1278 1276 1316"><b>Tip:</b> If you have a tablet that more than one person uses, each person can have different location access settings.</p> <p data-bbox="375 1344 1247 1373"><b>Attachment 40 (Manage your Pixel phone's location settings) at 3 &amp; 4.</b></p>



Claim 1	Corresponding Structure in Accused Systems
	<div data-bbox="418 239 930 331"><p>1. On your Android device, go to <b>Settings</b></p><p>2. Tap <b>Location</b> and re-enable your location services</p><p>3. Select <b>Mode High accuracy</b></p></div> <div data-bbox="615 365 1211 737"></div> <div data-bbox="1222 359 1433 705"><p>The user of the wireless device can select the method of the location estimation</p></div> <p data-bbox="384 772 1230 798">On some phone models, this option can be found under the Advanced Settings option.</p> <p data-bbox="384 837 1438 894">Select <b>Advanced Settings</b> and enable your device to improve positioning accuracy by allowing apps to scan for Wi-Fi networks and Bluetooth devices at any time, even if Wi-Fi or Bluetooth is disabled.</p> <div data-bbox="615 930 1211 1310"></div> <p data-bbox="375 1346 1105 1379"><b>Attachment 33 (Google Maps Not Updating Location) at 4.</b></p>

**Claim 1****Corresponding Structure in Accused Systems**

	DESCRIPTION	OPT-IN / OPT-OUT	USER CHOICES
LOCATION SERVICES	"Use Google's location service to help apps determine your location. Anonymous location data will be sent to Google when your device is on."	Opt-Out	"YES, I'M IN" or "SKIP"
LOCATION ACCURACY	Three Modes - "High accuracy", "Battery saving", and "Device only". Default setting: "High accuracy use(s) GPS, Wi-Fi, Bluetooth, or cellular networks to determine location"	Opt-Out	Toggle icon (right and colored for on, left and gray for off). This setting not shown during Android set-up.
LOCATION SCANNING	"Improve location accuracy by allowing apps and services to scan for Wi-Fi and Bluetooth, even when those settings are off."	Opt-Out	Toggle icon (right and colored for on, left and gray for off).
LOCATION HISTORY	"[A]llows Google to store a history of your location data from all devices where you are logged into your Google Account and have enabled Location Reporting. Location History and Location Reporting data may be used by any Google app or service."	Opt-Out	"YES, I'M IN" or "NO THANKS"  In the context of "Give your new Assistant permission to help you"

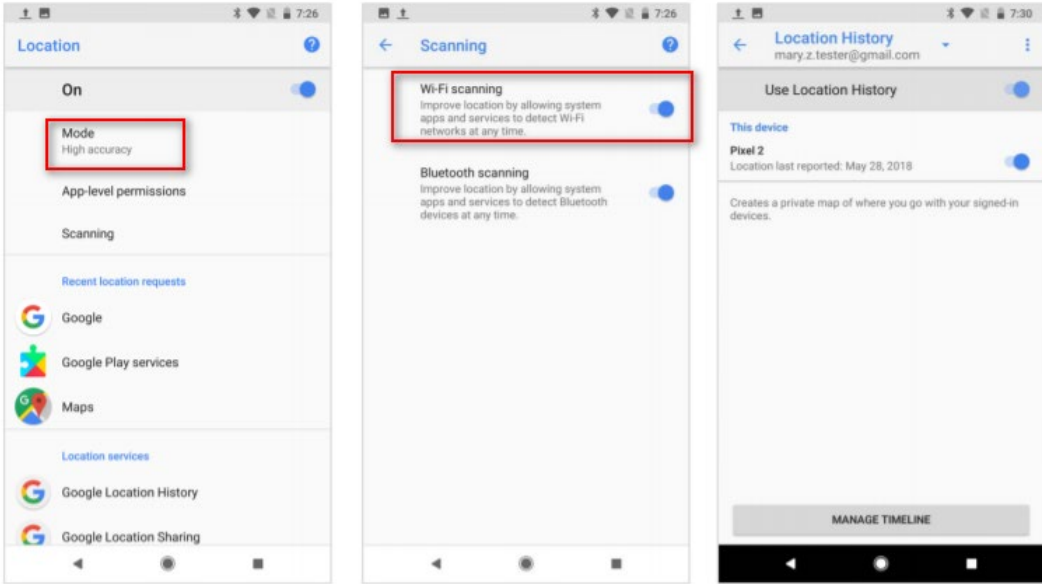
Figure 1: Four Android settings and services that relate to location information collection.<sup>1</sup>

**Google Location Services**

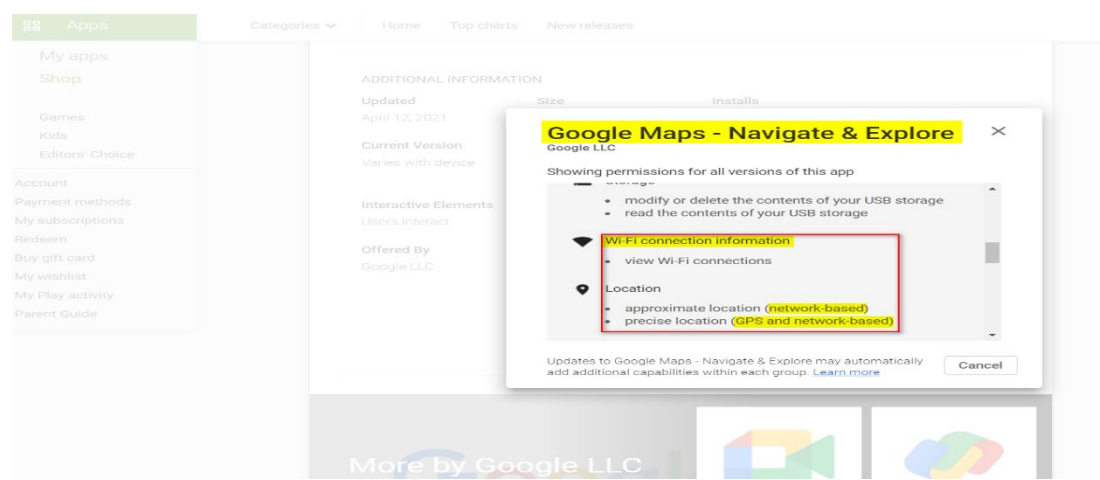
Google Location Services (GLS) operate at a device level and rely on sensors such as GPS, Wi-Fi, the cellular radio, and other technologies included in mobile devices to position a user in the world. If a user keeps the default settings prompted by Google, Location Services is enabled, Location Accuracy will be set to "High Accuracy"<sup>2</sup> and Location Scanning will be enabled for both Wi-Fi base stations and Bluetooth Beacons, regardless of a user's choice to turn Wi-Fi or Bluetooth on. The implications of user choices among the various Location Services settings are significant, but not intuitive, including:

- With Location Services turned on, Location Accuracy set to "Device only" and Location Scanning turned off, an Android device will only use GPS to provide the location of an Android device.
- When Location Accuracy is set to "High accuracy" and Location Scanning is enabled (the default setting for new device setup), an Android device will use sources including Wi-Fi, Bluetooth, and cellular radio to improve the accuracy of the device's position.

Attachment 38 (Google, Android and Location Tracking) at 2.

Claim 1	Corresponding Structure in Accused Systems
	<p data-bbox="391 247 1446 310">After completing the setup process users can validate and control settings for device location via the Settings app and navigating to Google settings, then Location (Figure 4).</p> <div data-bbox="410 365 1446 945"></div> <p data-bbox="662 959 1195 982">Figure 4: Location settings after Android device setup process</p> <p data-bbox="391 1010 1425 1108">As demonstrated in Figure 4, if users accept Google’s defaults during the setup process, the Android device is configured with Location Services enabled, Wi-Fi and Bluetooth scanning engaged, and Location History active.</p> <p data-bbox="375 1157 1149 1188"><b>Attachment 38 (Google, Android and Location Tracking) at 5.</b></p>

Claim 1	Corresponding Structure in Accused Systems
	<p>Users can choose to disable GLS during the set-up process. However, if a user attempts to disable GLS, a warning dialogue box prompts an extreme scenario: “device location for all apps is turned off and you may not be able to locate your device if it is lost.” (Figure 5) Note as well, the action prompt is to “Turn on Location” – reversing the user choice triggering the warning. Further, as described immediately below, many Google and third party apps will not function unless GLS is turned on. Therefore, Google forces user into an impossible ultimatum, have their every move constantly monitored, tracked, and stored or lose the functionality of their expensive smartphone.</p> <p>If a user disables Location Services but then attempts to use a location aware app or service on their device, she will see the dialogue box shown in Figure 6. If the user clicks “OK” the service is enabled for the entire device and permanently, rather than enabling Location Services only for that particular app or service requesting the functionality.</p> <div data-bbox="532 604 847 1079"></div> <div data-bbox="532 1087 847 1108"><p>Figure 5: Location Services Warning</p></div> <div data-bbox="938 604 1263 1079"></div> <div data-bbox="971 1087 1230 1129"><p>Figure 6: Re-Enable Location Services</p></div> <p><b>Attachment 38 (Google, Android and Location Tracking) at 6.</b></p> <p>We collect information about your location when you use our services, which helps us offer features like driving directions for your weekend getaway or showtimes for movies playing near you.</p> <p>Your location can be determined with varying degrees of accuracy by:</p> <ul style="list-style-type: none"><li>• GPS</li><li>• IP address</li><li>• <a href="#">Sensor data from your device</a></li><li>• Information about things near your device, such as Wi-Fi access points, cell towers, and Bluetooth-enabled devices</li></ul> <p>The types of location data we collect depend in part on your device and account settings. For example, you can <a href="#">turn your Android device's location on or off</a> using the device's settings app. You can also <a href="#">turn on Location History</a> if you want to create a private map of where you go with your signed-in devices.</p> <p><b>Attachment 29 (Google Privacy Policy) at 4.</b></p>

Claim 1	Corresponding Structure in Accused Systems
	<div><p>The screenshot shows the Google Play Store interface for the app "Google Maps - Navigate &amp; Explore" by Google LLC. A permissions dialog is displayed, listing permissions for storage, Wi-Fi connection information, and location. The "Wi-Fi connection information" section is highlighted with a red box, and the "Location" section shows "approximate location (network-based)" and "precise location (GPS and network-based)".</p></div> <p><b>Attachment 39 (Google Map_Permissions) at 1.</b></p>

11. Defendant makes, uses, offers to sell, and/or sells within or imports into the U.S., wireless-network systems, devices and methods; and related components, applications, programs, functionality, and services that use identified locations of wireless devices to provide tracking such that Defendant infringes claims 1–24 of the '147 patent, literally or under the doctrine of equivalents.
12. Defendant put the inventions claimed by the '147 Patent, including systems, devices and methods, into service, i.e., used them and controlled them as a whole as well as on an element by element basis. But for Defendant's actions, the claimed-inventions embodiments involving Defendant's products and services would never have been put into service. Defendant controlled the systems, devices, and methods to provide the benefits of location data, mapping, navigation, traffic updates, tracking, and other features of the claim inventions as set out in the evidence charts above.
13. Defendant derives benefits from claim elements met by third party wireless communication networks such as Verizon, AT&T, and T-Mobile (identified by name in the evidence charts above). Those benefits include performing the specifically identified functions of those wireless communication networks (e.g., communicate location of a wireless mobile communications device). Defendant obtains those benefits by putting those functionalities into use, i.e. controlling them, as per the evidence charts mentioned above.



14. Moreover, Defendant obtains the benefits, which are necessary to the operation of the claimed inventions, from the wireless communications networks it puts into use of at least:

- Receiving information indicative of a location of the wireless mobile communications device;
- Receiving updates of navigation information in conformity with traffic congestion information.

15. Other benefits tied to the use of the wireless communications networks include:

- Use of the acquired location data to benefit and improve the operation of the Google Maps application;
- Use of the acquired location data to benefit Google's other services, such as application purchases, targeted marketing and support of other Google apps to drive up the purchase of other apps;
- Use of the acquired location data to facilitate transactions involving Google;
- Use of the acquired locations data to make Google Maps functional to drive sales of Google wireless devices and other third party devices pre-loaded with Google Maps.

16. Defendant has and continues to knowingly induce infringement. Defendants have actively encouraged or instructed others (e.g., its customers and other parties such as AT&T, Verizon, and T-Mobile, and Sprint), and continues to do so, on how to use its products and services (e.g., wireless-network components and related applications and programs that use identified locations of wireless devices to provide tracking of mobile devices) such as to cause infringement of claims 1–24 of the '147 patent, literally or under the doctrine of equivalents.

17. Google has the specific intent to cause direct infringement by Google's customers and

other parties such as AT&T, Verizon, T-Mobile or Sprint, as evidenced by Google's selling, offering for sale, marketing, advertising, preloading or making available for download or purchase the Google Maps application as well as making the Google Maps application and the Google Maps servers available to its customers and other parties. Google benefits from each and every claimed element and functionality, including those provided by the wireless communications networks, because without each of them being put into service, Google would not be able to operate the Google Maps application and all its features.

18. Defendant has known and should have known of the '147 patent, by at least the date of the patent's issuance, or from the issuance of the '284 patent, which followed the date that the patent's underlying application was cited to Defendants by the U.S. Patent and Trademark Office during prosecution of one of Defendant's patent applications, such that Defendant knew and should have known that it was and would be inducing infringement.
19. Defendant has and continues to contributorily infringe. Defendant has actively encouraged or instructed others (e.g., its customers and other parties such as AT&T, Verizon, and T-Mobile, and Sprint), and continues to do so, on how to use its products and services e.g., wireless-network components and related applications and programs that use identified locations of wireless devices to provide tracking of mobile devices) such as to cause infringement of one or more of claims 1–24 of the '147 patent, literally or under the doctrine of equivalents.
20. Google's customers and/or other parties, such as AT&T, Verizon, T-Mobile or Sprint, directly infringe by putting the entire system into use and benefitting from each and every element or functionality of the system. For example, Google's customer may use the Google Maps application to communicate location information via the wireless communications device, the wireless network, the base station, and the Google Server. Google provides material components of the system, including, for example, the Google Maps application that is saved on the wireless communications device and the Google

server or computer because these components allow Google's customer to communicate the location information between the wireless communications device and the Google Server.

21. Additionally, Google sells, offers to sell, advertises, markets, preloads or makes available for download or purchase the Google Maps application to encourage the Google customers and other parties such as AT&T, Verizon, T-Mobile or Sprint to use the Google Maps application preloaded on the wireless communications device or to downloaded using iOS or Android applications store, and by touting its features and benefits to the application users such as navigation and geographic location benefits. Google also instructs its customers on how to use navigation data, to obtain location, as well as toggle location privacy setting on or off within the Google Maps application by providing user manuals, guides and instructions on how to do so.
22. Further, Google Maps application and Google Server are not staple article of commerce because there is no substantial non-infringing use of these products and features other than to practice the claimed invention. Google benefits from each and every claimed element and functionality because without each of them being put into service, Google would not be able to operate the Google Maps application and all its features. Thus, Google maps would not have the economic benefit of being able to sell or license the Google Maps applications to customers and other parties.
23. Defendant has known and should have known that it's products and service, including but not limited to Google Maps application and Google servers or computers, are especially made or especially adopted for use in an infringement. Moreover, Defendant has known of the '147 patent and the technology underlying it from at least the date of issuance of the patent or from the issuance of the '284 patent, which followed the date that the patent's underlying application was cited to Defendants by the U.S. Patent and Trademark Office during prosecution of one of Defendant's patent applications, such that Defendant knew and should have known that it was and would be contributorily infringing.
24. Google's actions constituted and continue to constitute willful infringement of the asserted claims of the '147 Patent. Google knew of the patent-in suit at least as of at least the date of

issuance of the patent or from the issuance of the '284 patent, which followed the date that the patent's underlying application was cited to Defendants by the U.S. Patent and Trademark Office during prosecution of one of Defendant's patent applications. After acquiring that knowledge, Google continued to directly infringe the asserted claims of the patent-in-suit, as previously explained in this complaint. Google has also knowingly continued to indirectly infringe the asserted claims, both by inducement infringement and by contributory infringement, as previously explained in this complaint. Google thus knew or should have known that its conduct amounted to infringement of the '147 Patent.

25. Defendants have caused and will continue to cause Traxcell damage by infringing the '147 patent.

#### **IV. PRAYER FOR RELIEF**

WHEREFORE, Traxcell respectfully requests that this Court:

- i. enter judgment that Defendants have infringed the Patent-in-Suit;
- ii. award Traxcell damages in an amount sufficient to compensate it for Defendants' infringement of the Patents-in-Suit, in an amount no less than a reasonable royalty, together with prejudgment and post-judgment interest and costs under 35 U.S.C. § 284;
- iii. award Traxcell an accounting for acts of infringement not presented at trial and an award by the Court of additional damage for any such acts of infringement;
- iv. declare this case to be "exceptional" under 35 U.S.C. § 285 and award Traxcell its attorneys' fees, expenses, and costs incurred in this action;
- v. declare Defendants infringement to be willful and treble the damages, including attorneys' fees, expenses, and costs incurred in this action and an increase in the damage award pursuant to 35 U.S.C. §284;
- vi. a decree addressing future infringement that either (i) awards a permanent injunction

enjoining Defendants and their agents, servants, employees, affiliates, divisions, and subsidiaries, and those in association with Defendants, from infringing the claims of the Patents-in-Suit or (ii) award damages for future infringement in lieu of an injunction, in an amount consistent with the fact that for future infringement the Defendants will be adjudicated infringers of a valid patent, and trebles that amount in view of the fact that the future infringement will be willful as a matter of law; and,

vii. award Traxcell such other and further relief as this Court deems just and proper.

**JURY DEMAND**

Traxcell hereby requests a trial by jury on issues so triable by right.

Respectfully submitted,

**Ramey & Schwaller, LLP**

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**CERTIFICATE OF SERVICE**

Pursuant to the Federal Rules of Civil Procedure and LR5, I hereby certify that all counsel of record who have appeared in this case are being served on this day of March 2, 2022, with a copy of the foregoing via email and ECF filing.

/s/ William P. Ramey, III  
William P. Ramey, III